Concrete Construction® Ten-year Index: 1977-1986

Information published in *Concrete Construction* magazine classified by subject matter

This index lists subjects that have been covered in articles, problem clinic answers, letters to the editor or news items that appeared in *Concrete Construction* from January 1977 through December 1986. The listing gives the subject and its location in the following way:

Air entrainment
factors affecting, **84.717**
(subject / year / page)

Pages are numbered consecutively throughout each year. If you want to identify the month in which an article appeared, use the page numbering table on page 878.

Generally, the page number given is the first page of an article in which the subject appears. In some cases, special issues of the magazine consisted of a series of questions and answers. For these issues, only the page number on which the subject appears is listed.

For information published in 1987, see the article index in the December 1987 issue.

Availability of articles

All items referenced in the index are available in the form of photocopies. These may be ordered from Concrete Construction Publications on a prepaid basis at a cost of $1.00 per item ordered. When the subject appears in an article, a photocopy of the entire article will be supplied for the $1.00 fee.

When ordering photocopies of indexed items, list them exactly as they appear in the index. For example, if you wish to purchase all four items shown under "cement burn," list them as follows and enclose a check for $4.00:

Cement burn
prevention methods, **79.704, 82.361**
skin protection from, **74.134, 75.588**

Bound volumes

Back issues of *Concrete Construction* magazine are available in hard-cover bound volumes (except 1970, 1972, 1973, 1975, and 1978) at $19 per volume.

How to order

All orders for photocopies or bound volumes must be prepaid (check or money order) and directed to:

Book and Reprint Division
Concrete Construction Publications, Inc.
426 South Westgate
Addison, Illinois 60101

A

Abrasion resistance, affected by polypropylene fibers, **86.363**

Abrasive blasting. *See also* Sandblasting
stain removal methods, **86.539**

Absolute volume, basis for yield calculations, **86.313**

Abutments, designed square for skewed bridges, **78.465**

Accelerated job schedules, costs and damages, **86.178**

Accelerated strength tests, **79.607**
methods and uses, **81.665**

Accelerators. *See also* Admixtures; Calcium chloride
effect on drying shrinkage, **83.563**
nonchloride
case histories, **82.789**
dosages and cost, **85.345**
types and benefits, **85.345**
trend away from chlorides, **82.796**

ACI training programs, technicians and craftsmen, **82.855**

Acid etching
methods, **81.31**
purpose and techniques, **77.124**

Acid rain, sculpture protected from, **83.50**

Acid resisting brick, special tolerances needed, **80.851**

Acid resisting concrete, calcium aluminate cement, **82.437**

Acids, effect on hardened concrete, **81.25**

Acoustic signals, used to find voids in fresh concrete, **83.839**

ACI building code
chloride limits proposed, **82.779**
field bending of rebar, **83.245**

ACI certification programs, field test technician, **86.727**

ACI guide, residential concrete, **83.757**

ACI reference specification 301, **83.451**

Acrylic concretes
making and repairing with, **84.881**
properties, **84.881**

Acrylic latex. *See* Latex modified concrete

Acrylic resin
protects sculpture from acid rain, **83.50**
repairs industrial floors, **81.55**

Acrylic sealer, reduces heat loss, **83.560**

Acrylics, coatings and stains for concrete, **81.406**

Admixtures
accelerators, nonchloride, **85.345**
air-entraining, **85.351**
calcium chloride ban opposed, **82.805**
calcium nitrite inhibits corrosion, **85.355**
corrosion inhibiting, **79.601**
effect on air content, **84.717**
effect on concrete of common types, **85.827**
fly ash, benefits for concrete, **85.321**

(more)

Admixtures . . . continued
gelling agents for grout, **84.47**
ground slag, **82.448**
handbook of reference data, **86.683**
microsilica, **82.443**
microsilica (silica fume), effect on concrete properties, **85.327**
mortar requirements, ferrocement sculpture, **86.547**
nonchloride accelerators, case histories, **82.789**
shrinkage compensating concrete, **83.331**
superplasticizers, **79.25, 82.409, 85.337**
effects of, **78.142**
types for architectural concrete repair, **86.623**
water reducers
how to use, **85.333**
types compared, **79.383**

Adventure in Concrete, sculpture honors Andersons, **84.313**

Aggregates
carbonaceous for electrical conductivity, **80.411**
coarse, influence D-cracking, **80.593**
decorative, sources listed, **84.42**
effect on saw or drill performance, **85.753**
grading procedure explained, **85.827**
high density, sources, **81.229**
how properties affect concrete, **85.827**
magnetite sources, **78.380**
metallic floor hardener, **77.73**
moisture determination for mix design, **86.329, 86.902**
perlite insulating concrete, **78.411**
polystyrene beads, **78.411**
presoaking methods for lightweight, **85.505**
radiation shielding, **80.622**
reclaimed from returned ready mix, **86.299**
recycled, admixture effects, **84.438**
recycled concrete used for, **80.725**
recycled from left-over concrete, **83.540**
sparkling for flatwork, **85.463**
vermiculite, **78.411**

Agricultural uses
catalog of plans for, **85.391**
concrete quality needed, **86.639**
earth-sheltered buildings, **83.229**
earth-sheltered hog houses, **83.241**
freeze-proof waterer, **81.535**
grain storage facilities, **83.237**
grooving tool for slip-resistant floors, **80.842**
guide to buying ready mix, **86.588**
hog pen dividers, **81.479**
horizontal silos built by tilt-up, **81.471**
information sources for farm builder, **81.485**
manure storage structures, **86.639**
Ontario pursues market, **81.499**
paving requirements, **86.639**
post-frame buildings, stronger with concrete, **81.477**
precast items, glass-fiber-reinforced, **83.250**
promotion work, **81.465**
slotted feeding floors cast in place, **83.235**
wall types, **86.639**

Air compressors, silenced models, **79.50**

Air content, affected by fly ash, **82.422**

Air content tests
contractor performs on paving job, **82.243**
field methods described, **85.833, 86.801**
meter cost and types, **86.801**
proper method important, **86.724**
purpose and methods, **81.557**

Air-entrained concrete, high strength, **84.843**

Air entrainment
admixtures for, **85.351**
effect on pavement scaling, **85.431**
factors affecting, **84.717, 85.55**
history, **81.1038**
how it protects concrete, **85.351**
importance in flatwork, **86.80**
low slump dense concrete, **86.74**
methods for high strength concrete, **77.77**
prevents scaling, **78.457, 80.139**
rapid air loss, fly ash concrete, **79.840**
value in concrete, **84.717**

Air meter. *See* Air content tests

Airport pavement
econocrete subbase, **82.860**
post-tensioned overlay, O'Hare runway, **82.261**
roller compacted concrete, **86.287**

Algae, removal of stain caused by, **84.58**

Alkali aggregate reaction, 85.55

Alkali silica reaction, 83.278

Alkyd paints, properties and uses, **81.406**

Aluminum, reactivity with concrete, **81.25**

Aluminum buckets, affect concrete strength?, **81.359**

Aluminum formwork
framing members and panels, **82.185**
slab support systems, **86.5**

Aluminum powder, expansion agent in grout, **77.140**

Aluminum stains, removal from concrete, **86.655**

Aluminum straightedges, no harm to concrete, **86.40**

Aluminum trusses, flying form support, **78.525**

American Concrete Institute. *See* ACI

American Society for Concrete Construction. *See* ASCC

American National Standards Institute, safety standards for formwork, **85.271**

Ammonium sulfate solutions, prevention of attack, **77.149**

Anhydrous ammonia, protecting concrete from, **82.114**

Aquarium construction, Seattle, **77.656**

Aquarium pool, plastic film repairs leaks, **84.901**

Aqueducts, history of development, **85.280**

Aramid fiber, composite with glass, **82.649**

Arch bridges, small spans of precast concrete, **85.659**

Arch construction
post-tensioned at Moscone Center, **83.103**
shotcrete over expanded metal, **85.197,** load tests, **82.581**

Architectural concrete. *See also* individual structures by name
Arcosanti (Soleri's city), **81.323**
Atlanta's outstanding structures, **82.8**
Baha'i Temple (Illinois), **83.119**
chapel of white concrete, precast with cast in place, **86.950**
church, earth-sheltered arch, **85.197**
color variations, causes/cures, **79.6**
condominiums made from silos, **83.5**
custom form liners, **82.567**
Fallingwater (house), **83.109**
forming lettering for, **85.257**
Goldberg, Bertrand, work of, **80.135**
grout cleandown, **79.319**
historic Mercer buildings, **82.561**
joint details, questions/answers, **78.590**
Lawson residence in Utah, CRSI award winner, **86.887**
leakproof forms required, **79.6**
Master Builders headquarters, **81.156**
mechanical tooling, **82.39**
mechanically tooled, formwork needs, **84.397**
mix design for, **79.6**
National Gallery of Art, East Building, **84.105**
Police Memorial Building, Jacksonville, FL, **82.587**
precast panels match limestone, **85.868**
references listed, **82.596**
repair materials, methods, **86.623**
ribbed exterior shear walls, **82.571**
sample panels help sales, **81.912**
sculptured panels with Indian design, **83.411**
specifications, **79.6**
specifying properly, **80.199**
spiral stair construction, **85.191**
surface finish, European examples, **82.575**
surface repair, **79.319**
surfaces affected by placing practices, **78.591**
surfaces cast against plastic liners, **82.51**
textured surfaces, Kentucky Horse Park, **80.470**
tilt-up, multistory, **86.97**
tilt-up simulates stone, **84.477**
troubleshooting questions, special issue, **78.575**
Unity Temple, design, **86.807**
walls pumped from bottom, **86.533**
Westin Hotel, Boston, **84.949**
world's tallest buildings, **83.91**

Architectural design
design-build system advantages, **85.911**
reasons for using concrete, **80.135**
Soleri's Arcosanti city, **81.323**

Arcosanti, Soleri's city grows, **81.323**

Asbestos fiber, reinforcement potential, **81.261**

ASCC, funds fountain at botanical garden, **86.35**

(more)

Asphalt, waterproofing below-grade walls, **86.384**

Asphalt stains, removal from concrete, **86.655**

Associations. *See also* specific organizations
- American Society for Concrete Construction, goals set, **86.590**
- Cement and Concrete Association, England, **79.463**
- codes and standards council formed, concrete and masonry industry, **86.414**
- Concrete Reinforcing Steel Institute, **81.830**
- construction owners organize, **86.252**
- international list, **79.827, 80.931, 81.1003, 82.966, 83.938, 84.1134, 85.1075, 86.1151**
- national (U.S.) list, **77.727, 78.759**
- scaffolding and shoring group expands, **80.427**
- stone groups merge, **85.114**
- tilt-up group organizes, **86.77**
- Wire Reinforcement Institute, **81.830**

Atlanta, Georgia, architectural concrete work, **82.8**

Autogenous healing, 77.132, 85.37

Avery, William M.
- becomes ACI honorary member, **83.476**
- retirement announced, **86.746**

B

Backfill, soil cement, **84.31**

Backfilling
- earth-sheltered buildings, **82.485**
- earth-sheltered construction, **80.659**
- methods for good drainage, **86.384**
- procedures for basements, **78.207**

Baha'i Temple (Illinois), design and construction, **83.119**

Bar supports. *See* Reinforcing steel

Barge (concrete)
- launched in Hawaii, **77.417**
- supports houseboat, **79.706**

Barrett, George, builds gravel wall house, 1852, **85.571**

Barrier walls
- precast
  - for privacy and security, **83.767**
  - noise control at Heathrow, **86.396**
  - shield microwave antenna, **84.741**
- slurry type limits waste seepage, **85.939**

Basements
- benefits in home marketing, **78.194, 85.609**
- block, repair with reinforced concrete, **83.141**
- block vs. poured, **80.612**
- construction recommendations, **78.199**
- design recommendations, **78.197**
- flooding and dampness cured, **77.164**
- guidelines for residential work, **85.609**
- leakage prevention, **78.211**
- settlement and heaving, **81.659**
- wall construction, **78.207**
- wall crack repairs, **81.491**
- wall cracks prevented, **84.246**
- wall leaks repaired, **81.419**
- wall reinforcement needs, **86.29**
- walls precast with integral footings, **86.877**
- waterproofing methods, **85.450**
- waterstops in joints, **80.474**
- wood, deficiencies, **77.380**
- wood and steel compete with concrete, **78.215**
- wood in Wisconsin, **82.654**

Basic Building Code, changes related to concrete, **84.23**

Batch plant, hand labor in Indonesia, **81.597**

Beam-column joint, fiber reinforcement improves seismic resistance, **80.529**

Beam stirrups, bent from wire mesh, **84.591**

Beams, wood, fabricated to support forms, **86.449**

Bearing wall, height increased to support masonry, **82.302**

Bellefontaine, Ohio, historic pavement, **77.20**

Bentonite
- earth-sheltered construction, **80.669**
- leakage repair, **81.31**
- slurry wall construction, limits waste seepage, **85.939**
- waterproofing below-grade walls, **85.691, 86.384**

Beverage stains, removal from concrete, **86.655**

Bidding
- preliminary priced proposal, **84.803**
- subcontractor's risk management, **85.120**

Bikeways
- built with slipform pavers, **80.431**
- construction in concrete, **77.644**
- recommended construction, **78.103**

Biltmore Hotel
- precast matches old masonry, **79.307**
- tiles copy textile blocks, **81.495**

Bituminous patching, pavements, **79.177**

Black concrete
- how to color, **78.580**
- Manhattan pavement, **83.461**

Black Hawk, historic Taft sculpture, **84.299**

Blast-furnace slag. *See* Slag

Blasting vibration. *See also* Vibration (transitory)
- effect on fresh concrete, **83.406, 85.214**

Bleeding
- behavior described, **79.223**
- causes and cures, **79.247**
- grout for post-tensioning tendons, **84.47**
- remedies outlined, **85.855**

Blemishes, formed concrete surfaces, causes tabulated, **79.719**

Blistering, causes and remedies, **79.247**

Blood stains, removal from concrete, **86.655**

Blowholes. *See* Bugholes

(more)

PAGE NUMBERING BY MONTHS FOR *CONCRETE CONSTRUCTION* MAGAZINE, 1977 THROUGH 1986*

Year	January	February	March	April	May	June	July	August	September	October	November	December
1977	1 – 68	69 – 120	121 – 196	197 – 248	249 – 308	309 – 376	377 – 420	421 – 472	473 – 532	533 – 592	593 – 660	661 – 784
1978	1 – 84	85 – 136	137 – 188	189 – 256	257 – 316	317 – 384	385 – 452	453 – 512	513 – 572	573 – 640	641 – 692	693 – 824
1979	1 – 106	107 – 158	159 – 218	219 – 302	303 – 354	355 – 434	435 – 502	503 – 586	587 – 654	655 – 714	715 – 786	787 – 902
1980	1 – 120	121 – 180	181 – 326	327 – 380	387 – 454	455 – 522	523 – 582	583 – 642	643 – 718	719 – 786	787 – 870	871 – 1002
1981	1 – 84	85 – 224	225 – 300	301 – 368	369 – 460	461 – 552	553 – 636	637 – 712	713 – 788	789 – 872	873 – 940	941 – 1074
1982	1 – 168	169 – 236	237 – 328	329 – 404	405 – 480	481 – 556	557 – 624	625 – 692	693 – 768	769 – 836	837 – 896	897 – 1028
1983	1 – 84	85 – 224	225 – 308	309 – 376	377 – 444	445 – 520	521 – 588	589 – 656	657 – 732	733 – 808	809 – 868	869 – 1000
1984	1 – 100	101 – 280	281 – 380	381 – 472	473 – 548	549 – 624	625 – 700	701 – 784	785 – 860	861 – 944	945 – 1036	1037 – 1184
1985	1 – 172	173 – 232	233 – 316	317 – 408	409 – 492	493 – 560	561 – 644	645 – 736	737 – 820	821 – 904	905 – 980	981 – 1136
1986	1 – 93	94 – 282	283 – 358	359 – 434	435 – 526	527 – 618	619 – 694	695 – 770	771 – 854	855 – 922	923 – 1016	1017 – 1168

* Covers included in pagination.

Board marked concrete
elastomeric form liner for, **82.182**
National Gallery of Art, construction details, **84.105**

Boatbuilding. *See also* Shipbuilding
ferrocement, **77.336, 77.337, 83.351**
methods, **77.205**

Bond breaker
choosing and using, **77.547**
tilt-up panels, **82.29**
weather effects on use, **77.547**

Bonding, other materials to concrete, **81.391**

Bonding agents. *See also* specific types
epoxy materials and methods, **79.169**
types and application, **77.125**

Book catalogs, concrete field, **77.735, 78.772**

Borrowing funds
interest costs explained, **77.541**
recommended procedures, **85.77**

Bosun's chair, construction workers' use, **80.797**

Bourgeois, Louis, Baha'i Temple architect, **83.119**

Box culverts, cast-in-place construction, **86.867**

Box girders. *See also* Bridge girders
form stripping using hydraulic ram, **86.318**
segmental construction method, **86.935**

Bracing, composite construction, **84.815**

Bramante, architect for Saint Peter's Basilica, **86.455**

Bridge decks
bracket for overhang construction, **83.276**
New River Gorge Bridge, construction, **78.220**
polymer concrete overlays, **84.711**
polymer impregnation, **79.272**
precast and post-tensioned, without overlay, **86.36**
rebuilt with precast panels, **84.147**
repair affected by traffic vibrations?, **86.260**
replacement and widening, lightweight concrete, **85.667**
resurfacing by Iowa method, **78.323**
steel plates add strength, **84.999**
thin bonded overlay, **84.705**
two-course construction, Iowa method, **78.323**
vacuum dewatering, **81.507**

Bridge girders
hydraulic ram aids form stripping, **86.318**
post-reinforcement repair, **84.705**
repair by epoxy injection, **84.170**

Bridge rehabilitation, cable-stayed design, **83.29**

Bridges
contracting methods affect cost, **85.649**
design of squared abutments, **78.465**
mobile manlift for repair, **81.431**
precast arch, construction procedure, **85.659**
redecking with lightweight concrete, **85.667**
repair and rehabilitation programs, **83.598**
segmental box girder
erection methods, **81.135, 83.350**
Houston Ship Channel, **83.115**
Marta system, **86.935**
state of the art, **81.135**
shoring support for repair, **84.744**
short span
case studies, **85.649**
cost comparisons, **85.649**
design aids, **85.649**
slab type, cast in place, **85.649**
strengthened with steel, grout bag bearings, **79.675**

Bronze stains, removal from concrete, **86.655**

Broom finish, ornamental for flatwork, **79.237**

Brooms, finishing tool, uses, **86.786**

Buckets, aluminum, **81.359**

Bugholes
architectural concrete, prevention, **79.323**
hiding with paint or coating, **77.481**

Building codes. *See also* specific codes
composite construction, **84.815**
control quality in Europe, **77.383**
earth-sheltered construction standards, **82.515**
earthquake design changes, **84.516**
Mexico, **86.379**
earthquake requirements, **84.489**
FHA abolishes one- and two-family standards, **86.246**
formwork regulated by, **85.271**
model code system explained, **84.23**
revision process explained, **84.23**

Building systems
cast-in-place townhouses, **85.597**
demountable slab-column assembly, **85.523**
insulated prestressed panels, apartments, **85.596**

Bulkhead forms
expanded metal, **83.552, 86.966**
slotted plywood, **86.867**

Bull floating
flatwork
recommendations, **79.225**
tools and techniques, **86.786**
nonconducting handles for safety, **86.571**

Burger, Elizabeth, sculptor in gypsum cement, **86.734**

Busch Gardens theme park, concrete simulates landscape features, **78.344**

Bushhammering, unsuitable preparation for shotcrete, **85.462**

Business organization
borrowing costs analyzed, **77.541**
borrowing practices recommended, **85.77**
buy-sell agreements, estate taxes, **80.682**
choosing executor for estate, **86.190**
collection techniques and policies, **85.872**
computer use, case histories, **83.605**
computers for estimating, **84.163**
contractor as precaster, **80.791**
contractor failure analysis, **78.101**
corporate brochure aids marketing, **83.623**
cost of accelerating construction, **86.178**
cost of owning equipment, **86.239**
creative selling, **80.352, 80.550**
design-build fast track favors concrete, **85.251**
directors/advisers for family business, **77.259**
family ownership planning, **85.104**
family succession problems, **77.29, 78.33**
income tax problems resolved by IRS, **86.493**
marketing department, how to establish, **84.39**
marketing plans, **81.889**
microcomputers for planning, scheduling, **86.153**
negotiated work, **84.340**
paid-in-full checks, **86.497**
planning for safety, **82.333**
preliminary priced proposal, fosters competition, **84.803**
promotion by ready mix suppliers, **85.61**
repair work a specialty, **83.36**
risk management for subcontractor, **85.120, 85.122, 85.126**

Buyers' guide
product and source listings, **77.679, 78.696, 79.792, 80.874, 81.945, 82.901, 83.873, 84.1041, 85.984, 86.1021**
products and trade names, transportation field, **79.102**

C

Cable-stayed design, bridge rehabilitation, **83.29**

Caboose, cast in concrete, **80.11**

Caisson construction, water intake for power plant, **83.389**

Calcium aluminate cement
arctic construction with, **78.504**
conversion explained, **82.437**
description and uses, **81.331**
proposed for winter work, **77.42**
repair material, **79.177**
when and how to use, **82.437**

Calcium chloride. *See also* Chloride ion
ban on use as admixture opposed, **82.805**
concern over use as accelerator, **82.796**
controversy over limits, **82.773**
definitions related to chloride ion, **82.775**
does use as accelerator cause corrosion?, **82.802**
effect on drying shrinkage, **83.563**
liquid vs. solid, **85.55**
pros and cons on limits, **82.811**

(more)

Calcium chloride . . . continued
replaced by nonchloride accelerators, **85.345**
use limited in Britain, **77.116, 82.794**

Calcium magnesium acetate, noncorroding deicer, **84.230**

Calcium nitrite
corrosion inhibitor, **79.601**
how to use, **85.355**

Calcium sulfate, fast-setting repair, **79.177**

Calcium sulfate cement, bridge patches, **80.98**

Camber, needs for form or structure, **80.199**

Canadian National Tower, construction story, **83.125**

Candy stains, removal from concrete, **86.655**

Canoes (concrete)
building and racing, **77.331**
race at Akron, **86.248**

Cantilever construction
Houston box girder bridge, **83.115**
segmental box girder bridges, **81.135**

Carbide lime, construction uses, **79.636**

Carbohydrates, water reducing admixtures, **85.333**

Carbon fiber reinforcement
properties, **81.261**
use in Japan, **86.49**

Carbonaceous aggregate, electrically conductive concrete, **80.411**

Carbonation
floor slabs
causes dusting, **79.735**
prevention, **79.735**

Cast-in-place pipe, 79.162

Cathodic protection
bridge deck concrete, **78.614**
reference book, **86.830**
reinforcing steel, **84.561**

Caulking compound, removal from concrete, **86.655**

Cavitation, compared with erosion, **81.13**

Cellular concrete
insulating value, **83.543**
panels for home building, **85.584**
properties and production, **78.411**
properties and uses, **81.229, 81.253**

Cement. *See also* particular types
blended, using ground slag, **82.448**
blended hydraulic, properties and uses, **81.331**
calcium aluminate, benefits and uses, **82.437**
color affects architectural concrete, **78.579**
colored and white in colored concrete, **82.19**
conservation via replacements or admixtures, **78.620**
effect on concrete color, **80.446**
energy used in production, **78.388**
fast setting, types and uses, **81.331**
high iron oxide, saves manufacturing energy, **78.112**
history of development, **85.519**
history of packaging, **82.100**
kiln dust reused, **79.332**
masonry, **81.331**
natural used in Erie Canal, **81.1026**
portland, patents and early use, **81.1028**
portland types described, **85.827**
prevention of lumps, **79.412**
protection during bagged storage, **78.284**
rice hull, acid resistant, **77.54**
roman patented, 1796, **81.1025**
solidifies hazardous wastes, **85.781**
special types reviewed, **81.331**
substitute Type II for V, **84.1011**
types compared, **85.55**
types for fast set repairs, **79.177**
uniformity from one source, **77.87**
water repellent, **81.331**

Cement and Concrete Association, research work, **79.463**

Cement burn
prevention methods, **82.361**
warning labels or tickets, **85.74**

Cement consumption, growth predicted in energy-saving uses, **83.531**

Cement content, measuring in fresh concrete, **77.427**

Cement production
California plant expansion, **80.847**
California shortage, **77.722**
Europe, 1976, **77.399**
history of, **81.204**
increase in 1978, **79.297**
new dry-process plant, **80.158**
new facilities needed, **80.347**
new slag cement plant, **82.463**
shipments in 1976, **77.234**
shortages explained, **78.540**
shortages spread, **78.662**
slag cement saves energy, **81.347**

Certification programs
craftsmen and technicians, **82.855**
technician, ACI, **86.727**

Chapel, white precast with cast-in-place, **86.950**

Checkerboard casting, not recommended, **81.745**

Chemical attack. *See* Durability; Deterioration; specific agents

Chemical names, cleaning materials for concrete, comprehensive listing, **86.961**

Chesapeake Bay Bridge, durability studies, lightweight concrete, **85.667**

Chewing gum, removal from concrete, **83.279, 86.655**

Chicago Botanical Garden, fountain in precast concrete, **86.35**

Chimney, waterproofing problems, **85.541**

Chipping tool, removes fins, **79.551**

Chloride ion. *See also* Calcium chloride
ACI recommends limits, **78.153**
cause of corrosion?, **82.785**
concentration percentages explained, **82.775**
limits for prestressed concrete, **85.393**
limits proposed, **82.773**
limits proposed by ACI Committee 201, **82.777**
limits set by ACI 212, **85.345**
pros and cons of limits, **82.811**

Chlorinated rubber coatings, properties and uses, **81.406**

Church (West Cannon Baptist), earth-sheltered arch construction, **85.197**

Clay, compaction methods, **85.681**

Cleaning. *See also* Stain removal and particular stains
chemical materials for, comprehensive list, **86.961**
dirt removal from concrete, **86.655**
equipment types available, **86.927**
flame treatment method, **78.275**
historic buildings, **83.712, 84.58**
joint sealant from white concrete, **86.330**
stain removal methods, **86.539**
stains and efflorescence, **77.128**

Cliff walls, constructed for climbers, **77.331**

CN Tower. *See* Canadian National

Coatings. *See also* Paint
dampproofing for walls, **81.309**
epoxy, **79.169**
how to choose for concrete, **77.477**
preparing concrete for, **77.481, 81.401**
protective and decorative, comprehensive report, **81.406**
protective for concrete, **77.145, 81.25**
urethane for walls, **77.485**

Codes. *See* Building codes

Cold milling, definition, **83.47**

Cold weather
early freezing of concrete, **86.890**
wind chill effect on concrete, **86.41**

Cold weather concreting
curing blankets, closed cell plastic, **79.782**
floor construction problems, **80.307**
historic *Black Hawk* statue, **84.299**
insulating blankets on mass concrete, **82.787**
nonchloride accelerator use, **82.789**
panelized enclosure, **80.250**
precautions summarized, **84.789**
repair with shotcrete, **79.414**
temperature control, **77.267**

Color
added during silt-casting, **81.323**
architectural concrete, questions/answers, **78.580**
chemical stains used for, **82.19**
matching in repair materials, **86.623**
mineral oxide pigments for, **82.19**
ornamental flatwork, **79.237**
pattern stamped concrete, **79.441, 86.775**
variability, prevention, **79.6**

Colored cement, used to color concrete, pros and cons, **82.19**

Colored concrete
curing, **82.19**

(more)

Colored concrete . . . continued
five ways to make it, selection guide, **82.19**
pigment recommendations, **81.229**

Column forms. *See* Formwork, column

Column mounted shoring
flying form tables, **84.949**
systems described, **83.455**
when to use, **86.5**

Columns
cost, square vs. round, **86.478**
cracks caused by creep, **81.737**
grouted in fabric form, mine cavity support, **80.401**
pumped from bottom, **82.182**
shortening due to creep and shrinkage, **83.31**

Compaction. *See also* Vibration
vibrating screeds, **82.729**

Composite construction
action explained, **84.815**
concrete/concrete
fast tracked at Datran Center, **85.863**
slab and beam floor, **86.574**
formwork for slab on open-web joists, **85.437**
steel/concrete, stability problems, **84.815, 85.276**

Compressive strength
accelerated test for, **79.607, 81.665**
affected by early freezing, **84.821**
affected by polypropylene fibers, **86.363**
affected by water in mix, **80.339**
affected by water-cement ratio, **82.286**
effect of superplasticizers, **78.142**
increased by revibration, **77.537**
is slow development a problem?, **85.635**
low cylinder breaks, **81.563**
low test cylinders, causes, **85.855**
reasons for time of test, **82.672**
test results influenced by hot weather, **86.15**
tested with small cylinders, **79.751**
testing errors warned against, **86.724**

Computers
contractor uses, case histories, **83.605**
contractor's software for micros, **83.593**
estimating and job management, **84.163**
micro for contractors, **83.593**
micro used for planning and scheduling, **86.153**
software for estimating, **86.334**
software selection for scheduling, **86.153**

Concrete, types and properties, summary listing, **80.31**

Concrete burns. *See* Cement burn

***Concrete Construction* magazine**
article index, **77.667, 78.712, 79.810, 80.912, 82.940**
observes 25th anniversary, **81.753**
subject index 1968-1984, **85.1037**
subject index for 1960-1985, **86.1084**
troubleshooting index, **81.980**

Concrete industry
British perspective, **78.50**
growth in U.S., **80.48**
in distress or not?, **80.740**
progress with special concretes, special mixes, **81.229**
reference publications and standards for, **83.930, 84.1126**

Connection boxes, reinforcement at construction joints, **86.552, 86.836**

Connection strips, reinforcement at construction joints, **86.552**

Consolidation. *See* Vibration

Construction joints
form overlap needed, **79.6**
forming in slabs, **84.553**

Construction methods, concrete, summarized, **80.23**

Construction services. *See* Services directory

Continuously reinforced concrete
condition survey of overlays, **78.655**
railroad track slab, **81.212**
use as pavement overlay, **78.655**

Contract interpretation
change orders, **79.274**
compensable time, **80.492**
payment for extras, **78.337**
shop drawing approval, **82.864**

Contract relationships
bonding explained, **77.46**
change orders, **85.126**
claims against owner, **86.222**
cost-plus defined, **80.357**
design-build agreements explained, **85.909**
drawings coordinated, **85.122**
economy of subcontracting, **86.572**
guidelines for allowances, **80.818**
interpreting the "or equal" clause, **85.524**
interpreting the specifications, **85.378**
performance under defective specs, **85.458**
recordkeeping vital to claims, **85.126**
retention vs. bond, **79.565**
shop drawings, **77.63**
standard subcontract forms, **80.152**
subcontractor agreements, **85.120**
unit prices, **77.299**
waiver of lien, **77.113, 77.192**
work stoppages, reasons for, **85.704**

Contraction joints. *See* Control joints

Control joints
basement walls, **78.205, 86.561**
basement walls with waterstop, **80.474**
pavement, design, **83.401**
slab on grade, **86.561**

Controlled density fill. *See also* Econocrete
used for utility cuts, **85.719**

Conveyors, crane mounted, fed by self-propelled unit, **86.327**

Conveyors (belt)
equipment and features available, **85.183**
mounted on mixer trucks, **84.19**
troubleshooting tips, **85.183**
where and how to use, **85.183**

Copley Place (Westin) Hotel, construction, **84.949**

Copper, corrosion of water line in concrete, **85.877**

Copper stains, removal from concrete, **86.655**

Core drill
cuts concrete, **79.552**
large, 48-inch diameter, **78.70**

Corrosion, copper water line in concrete, **85.877**

Corrosion (reinforcement)
cathodic prevention, **78.614**
cathodic protection, **84.561**
causes, **81.91**
causes/remedies, **83.826**
coastal environment, reasons/remedies, **81.532**
control in bridges, **77.648**
damage to vertical concrete, **81.91**
effect of calcium chloride, **82.796**
effect of nonchloride accelerators, **85.345**
inhibiting admixture, **79.601**
prevented by calcium nitrite admixture, **85.355**
prevented by silane on concrete, **84.967**
process explained, **79.601, 81.91, 82.802, 84.561**
protection against, overlay vs. sealer, **84.503**
resisted by epoxy coating, **80.587**
test to detect, **85.364**
tests to analyze damage, **81.91**

Corrosion damage, repair methods for vertical surfaces, **81.97**

Corrosion threshold
chloride ion in concrete, **78.153, 82.802**

Cortina system. *See* Sistema Cortina

Cost comparisons
asphalt vs. concrete pavements, alternate bidding practices, **86.463**
columns, round vs. square, **86.478**
concrete vs. steel, **77.425, 78.653**
high-rise buildings, **80.331, 81.883, 81.896, 84.803**
curb and gutter construction methods, **86.699**
formwork systems for slabs, **86.5**
life cycle cost vs. present worth, pavements, **86.463**
slab strength vs. thickness, **84.902**
wall forming systems, **86.21**

Cost control
methods proposed for builders, **79.58**
nonresidential building, **78.222**

Couplers, threaded for rebar, **85.23**

CQM test procedure, fresh concrete, **84.317**

Crack control
basement walls, **78.205**
driveway corners, **86.482**
floor slabs
post-tensioned, **83.396**
with polypropylene fibers, **86.371**
jointing irregular slabs on grade, **86.391**
parking decks, **77.387**
polypropylene fiber effectiveness, **86.363**

Crack repair
basement walls, **81.491**
epoxy materials, **79.169**
leaking walls, **81.419**
materials/methods, **81.31**
methods reviewed, **85.37**
questions and answers, **77.132**

Cracking
basic process explained, **81.725**
caused by creep in columns, **81.737**
causes explained, **81.725**
control in hardened concrete, **85.855**
D-type, aggregate influence, **80.593**
floor slab topping, **86.166**
minimized in slabs on grade, **81.739**
plastic shrinkage
causes, **86.604**
causes and cures, **85.855**
prevention, **86.233, 86.835**
potential evaluated in slabs on grade, new method, **85.775**
prevention and control, **81.733**
prevention at driveway corners, **85.793**
reentrant corners, prevention, **85.134**
topping for floor slab, **86.162**
torsional in flat plates, **81.641**
types and causes, **81.13**

Cracks, plastic shrinkage, is repair needed?, **86.488**

Crane, luffing, with climbing mast at Trump Tower, **82.723**

Crane mounted conveyor, supplied by self-propelled unit, **86.327**

Crazing, reasons and remedies, **79.247**

Creep, causes cracks in columns, **81.737**

Cricket pitch, concrete slab for, **82.988**

Crushed concrete, recycled as aggregate, **80.725**

Cryogenic properties of concrete, LNG storage, **83.465**

Curb and gutter
construction costs compared, **86.699**
cross-section design, **86.699**
jointing practices, **86.699**
slipform construction, **86.699**
slipforming equipment, sticking concrete, **86.394**
stationary-form construction, **86.699**

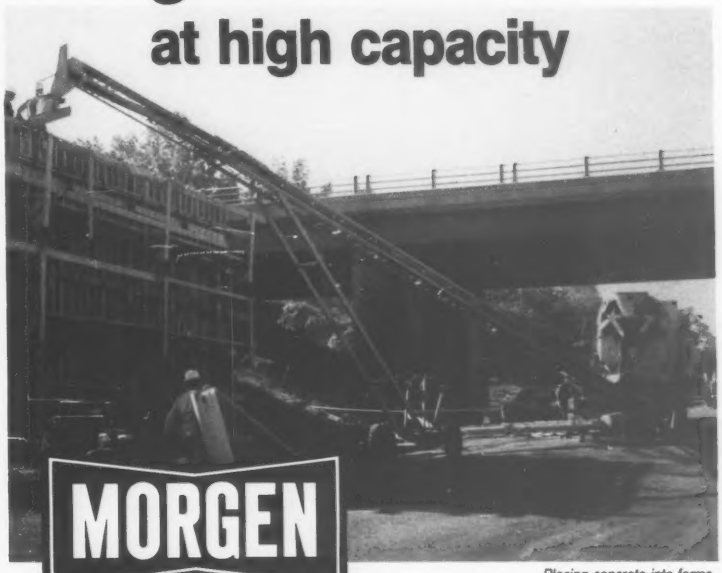
Curing
bridge deck overlays, **78.323**
cold weather precautions, **84.789**
electrically heated forms, tunnel system, **80.599**
flatwork recommendations, **79.245**
floor slabs, questions/answers, **80.308**
hot weather practices, **83.381**
methods to prevent scaling, **80.139, 80.845**
white concrete, **84.769**

Curing blankets, closed-cell plastic foam, **79.782**

Curling
simply supported slabs
prevention, **86.894, 86.903**
slab on grade
causes and remedies, **77.139, 79.78, 86.571**
has it stopped?, **77.506**

(more)

LOWEST COST WAY
to place concrete and granular material
at high capacity



Placing concrete into forms

MOBILE PLACER

Within its reach, a Morgen Mobile Placer portable conveyor can place concrete as fast as any concrete pump, without restriction of mix or slump. But it does far more than a pump can do. It can also handle backfill, aggregates, coal, etc. at rates up to 100 cu. yds/hr. It reaches 36 feet above or below grade or beyond the wheels. It is self-propelled with power steering so one man can operate.

More than 6,000 units are working successfully in 59 countries, under all possible conditions. Many contractors own several. Find out why.

Morgen Mobile Placer handling backfill

Call or write for complete information –
MORGEN MANUFACTURING CO. P.O. Box 160 Yankton, SD 57078
Call Toll Free 1-800-952-4726 Telephone (605)665-9654
Tx 910-668-3601 MORGEN YANK TF 605-665-7017

circle 157 on reader service card

Cutting concrete. *See also* Sawing
case histories, **82.81, 85.741**
methods listed, **77.158**
power and coolant requirements, **85.753**
sawing and drilling methods, **85.753**
water jet method, **81.605**

Cylinders. *See* Test cylinders

D

D-cracking
defined and explained, **80.593**
long term study, aggregate influence, **80.587**

Dampproofing. *See also* Waterproofing
materials and methods, **81.309**
term defined, **81.309**

Dams
grout seal for earth-fill, **77.393**
roller compacted concrete for, **82.709**
spillway crest shotcreted, **84.633**
undertow corrected at Little Falls, **86.721**

Darbying
flatwork
recommendations, **79.225**
tools and techniques, **86.786**

Datran Center, fast track construction, **85.863**

Decentering. *See* Form stripping

Deflection testing, pavements, **83.13**

Deicer salt scaling, prevention, **80.845**

Deicers
application during first winter, **86.231**
calcium magnesium acetate, noncorroding, **84.230**
effect on concrete, **86.501**
noncorrosive, **86.338**
various salts compared, **81.917**

Demolition
backhoe-mounted jackhammer, **82.368**
nonexplosive chemical method, **82.366**
prestressed beams, methods compared, **86.405**
structure resists dynamite, **81.132**
walking excavator with jackhammer, **82.368**
waterblasting removes bad concrete, **85.785**

Demountable buildings, assembly with precast slabs and columns, **85.523**

Design. *See* Architectural design; Mix design; Structural design

Design-build
contract relationships detailed, **85.909**
procedures and advantages, **85.911**

Design-build organization, fast tracking favors concrete frame, **85.251**

Detailing
post-tensioned buildings, **83.327**
reinforcing steel
ACI standard manual, **81.815**
affects placing cost, **83.675**
to relieve congestion, **83.669**
welded wire fabric, manual published, **84.43**

Deterioration. *See also* Durability
chemical action on concrete, detailed listing, **81.25**
proper maintenance prevents, **81.9**
types and causes, photo summary, **81.13**

Diamond blades, grind pavements smooth, **86.952**

Directories. *See* Associations or desired specialty

Discoloration. *See also* Stains
architectural concrete, prevention, **79.323**
flatwork, removal, **86.655**
formed surfaces, causes/cures, **79.548**
greenish blue, **77.128**
removal methods, **86.539**

Docks (London), renovation with concrete, **81.395**

Dome construction
inflated forms with foam and shotcrete, **78.405, 78.678, 82.511, 83.247**
precast with cast-in-place concrete, **86.399**
Saint Peter's Basilica, history, **86.455**
shotcrete plus insulation, energy saving, **83.532**
spiral generation of polystyrene form, **82.660**

Double-tee girder, load testing, **79.388**

Dowel bars
paving
automatic setters, **82.253**
design, **83.401**
spliced at construction joints, **85.23**
boxes or strips, **86.552**

Drag flight conveyor, recycles returned ready mix, **86.299**

Dragon sculpture, T. J. Neil, **83.415**

Drainage
earth-sheltered construction, **80.659**
in-plane prefab systems, **84.955**

Drainage structures, box culvert, cast in place construction, **86.867**

Drilling. *See also* Core drill
bit types described, **85.753**
case histories, **82.81, 85.741**
removes deteriorated waterstops, **85.747**
tools and techniques, **81.49**

Drip stains, removal from concrete, **86.821**

Driveways
crack control at corners, **86.482**
crack prevention at corners, **85.793**
polypropylene fiber reinforcement, **86.371**
repair of winter damage, **78.240**
scaling prevention, **78.457**

Drum mixers, rubber liner for, **78.341**

Dry concrete mix, helicopter delivery to remote site, **82.732**

Dry shake toppings
color hardeners, advantages/disadvantages, **82.19**
construction methods, **84.285**
hardeners for flatwork, **79.231**
types and uses, **84.285**

Drying shrinkage
field test proposed, **84.663**
test for cracking potential, slabs on grade, **85.775**

Drypack mortar
crack repair, **85.37**
repair method, **77.149**
surfaces precast to match old masonry, **79.309**

Duct system, underfloor for utilities, **82.639**

Dumping, unused ready mix, **86.299**

Durability. *See also* Deterioration and specific aspects
chloride ion limit
proposed, **78.153, 82.773**
proposed by ACI Committee 201, **82.777**
demonstrated by concrete, overview, **80.35**
effect of excess mix water, **80.339**
effect of microsilica in mix, **85.327**
flatwork scaling study, **80.139**
lightweight concrete drilling platform, **85.497**
pavement scaling prevention methods, **85.431**
seawater effects, **86.401**

Dusting
floor slabs
causes, **80.56**
liquid treatments, **77.141.**
reasons and remedies, **79.247, 81.9, 85.855**
formed surfaces, causes/cures, **79.546**

Dynamite,
demolition of building, **81.132**

E

Earley, John J.
exposed aggregate work
Baha'i Temple (Illinois), **83.119**
Fountain of Time, **84.797**
Meridian Hill Park, **84.117**

Earth-sheltered construction
advantages and examples, **78.90, 80.647**
arch shotcreted over expanded metal, **82.581**
Barnard ecology house, **78.90**
building code requirements, **82.515**
Central Pre-Mix building, **80.678**
concrete work, overview, **80.659**
cost effectiveness, **85.474**
design tips, **82.493**
dome modules for homes, **85.603**
domed roof homes, **80.684**
elementary school, Florida, **82.534**
energy conservation with, **83.537**
farm buildings, **83.229**
financing difficulties, **80.647**
foam and shotcrete over inflated form, **82.511**
footing design, **82.499**
home cast in single pour, **85.593**
home resists fire, **86.633**
home wins energy conservation award, **86.411**

home with passive solar, 82.364
information sources, 78.90
insulation and drainage details, 82.521
insulation installation, 80.665
insulation recommendations, 81.536
Iowa houses, 83.737
loads and deflections, 82.493
nature center saves energy, 83.529
new market for concrete, 82.73
post-tensioning benefits, 81.105
precast panel home and retaining wall, 80.688
precast panels make home, 82.507
questions/answers, 78.120
shotcrete over expanded metal for home, 82.43
shotcreted arch for church, 85.197
shotcreted barrel shell home, 85.583
shotcreted dome modules for homes, 85.598
site selection for, 80.653
soil factors detailed, 82.485
structural details, 82.521
Terraset school, 78.90
waterproofing materials, 80.669
waterproofing materials and methods, 80.675
zoning and financing problems, 82.589

Earth structures, reinforced, faced with precast panels, 84.653

Earthquake resistance
beam-column joint, fiber reinforced, 80.529
building performance, Mexico 1985, 86.379
code change proposals, 84.516, 84.918, 86.379
concrete structures, 80.35
Cortina lift slab buildings, 81.717
laboratory testing, full scale structures, 86.900
residential construction, 86.29

Earthquakes
how concrete structures resist them, 84.489
Mexico City, 1985, 86.379
origin and action, 84.489
San Fernando, 1971, 84.489

Ecology blocks, made from returned ready mix, 86.299

Ecology house, Barnard's earth shelter, 78.90

Econocrete, standard for airport subbases, 82.860

Economics. *See* Cost comparison

Eddystone lighthouse, 81.1025

Edgers, types available, 86.786

Edison, Thomas A., concrete houses, 81.1035

Educational programs. *See also* Training aids
ACI trains craftsmen and technicians, 82.855
children and concrete, British schools, 83.615
courses at PCA, 77.555
hands-on courses at PCA, 82.849

(more)

Separate the men from the boys with the CT-6000 Compression Tester.

You'll know right away which concrete samples pass and which fail. The microprocessor controlled CT-6000 from Soiltest automatically calculates the stress for cylinder, cube, beam or block samples. The results are guaranteed to comply with ASTM C-39 and ASTM E-4 standards.

You can record your findings 4 ways: copy directly from digital readout, store results in the CT-6000's memory, automatically get a hard copy with an optional printer or transfer results to your computer.

The CT-6000 Series is offered in 450,000 lb./2,000 kN or 675,000 lb./3,000 kN models. Both units feature our prestressed design that gives full protection and eliminates unnecessary bulk.

For more information on the CT-6000 Concrete Compression Tester, call **1-800-323-1242** (Illinois 1-800-942-3374) for a free brochure — or circle the reader service card.

SOILTEST®

Soiltest, Inc., Materials Testing Division
P.O. Box 8004, Lake Bluff, IL 60044, USA

circle 172 on reader service card

887

Educational programs . . . continued
needed for craftsmen, **83.837**
safety training for workers, **82.333**
seminars by WOC Conferences, **82.859**
shotcreting personnel, **82.851**

Efflorescence
causes and prevention, **85.55**
removal, **86.655**
removal from concrete tile floor, **85.708**

Elastomeric form liners, how to use, **79.669**

Electrical conductivity, how to establish in concrete, **80.411**

Electrical heating, tunnel form system, **80.599**

Electrical wiring, duct system in slab, **82.639**

Embankments, protected with soil cement, **84.31**

Energy conservation. *See also* Thermal lag; Insulation
aided by concrete thermal mass, **83.525**
catalog of concrete contributions, **83.532**
concrete advantages, overview, **80.45**
concrete pavement saves oil, **81.657**
earth cover aids concrete, **81.105**
earth-sheltered construction, **80.647**
earth-sheltered nature center, **83.529**
how much wall insulation?, **79.677**
insulated tilt-up panels, **80.458**
insulation core, stucco or shotcrete walls, **80.467**
methods at Arcosanti, **81.323**
methods used in Central Pre-Mix building, **80.678**
NAHB demonstration house, **81.424**
no-fines concrete, **79.123**
ocean thermal energy, concrete system for, **82.877**
solar heat and earth cover, Ohio library, **81.145**
thermal lag of concrete, **78.399**
with masonry walls, **79.692**

Energy consumption, manufacture of building materials, **78.388**

English village, miniature cast in concrete, **81.977**

Entrained air. *See* Air entrainment

Epoxies
bridge deck overlay, **84.711**
fast setting repairs, **79.177**
in failed concrete repairs, **80.735**
physical properties, **80.735**
repair material, specifications and properties, **84.873**
repair materials and methods, **79.169**
repair parking deck, **79.278**
repair uses, **81.31**

Epoxy bonding agents, how to use, **77.125**

Epoxy coated rebars. *See also* Reinforcing steel
fusion bonded, **80.587, 83.826**
how to specify, **84.809**

Epoxy coatings, properties and uses, **81.406**

Epoxy injection
bridge girder repair, **84.170**
crack repair, **85.37**
repairs leaking walls, **81.419**
shear crack repair by post-reinforcement, **84.705**
wall crack repair, **81.491**

Epoxy joint sealants, industrial floors, **78.331**

Epoxy modified concrete, corrosion resisting overlay, **84.503**

Epoxy mortar, failure of repair installation, **80.735**

Epoxy stains, removal from concrete, **86.655**

Equipment costs, how to calculate, **86.239**

Estate planning, selection of executor, **86.190**

Estimating
computer systems used, **83.605**
computer use for, **84.163, 86.334**
reinforcing bars, **81.793**

Excavation
basement construction, **78.207**
trenching safety, **86.556**

Expanded metal, bulkhead form, **83.552, 86.966**

Expansion joints
failure in parking decks, **81.651**
pavement, design, **83.401**
plastered walls, **80.484**
premolded sealant, **78.670**

Expansive cement concrete. *See also* Shrinkage compensating concrete
mix design, **86.172**

Expansive cements
description and uses, **81.331**
effect in concrete, **79.110**

Expansive soils. *See also* Soil conditions
damage structures, **84.657**
detection and adaptation to, **85.880**
void forms used in, **78.294**

Exposed aggregate
Earley's work at Meridian Hill Park, **84.117**
flame treatment method, **78.275**
for highway appurtenances, **78.46**
Fountain of Time sculpture, **84.797**
methods compared, **78.595**
methods used, **82.575**
ornamental flatwork, **79.237**
precast panels, Baha'i Temple, **83.119**
seeding method explained, sidewalks, **78.335**
tilt-up panel fabrication, **86.97**
tilt-up panels, **82.36**
Unity Temple use, **86.807**

REPRINT COLLECTIONS

Selected articles from the pages of *Concrete Construction* have been reprinted in booklet form, gathering useful information on such varied topics as

- testing
- vibrating
- finishing
- repair

See page 916 for a complete listing of available reprint collections.

F

Fabric filters, in-plane drains, **84.955**

Fabric forms
bags filled with grout, dam renovation, **86.721**
bags or mats, methods of using, **80.401**
revetments for erosion control, **80.395**

Faceted glass
framed with mortar or concrete, **78.459**
panels framed in ferrocement, **82.193**
sculpture framed with ferrocement, **86.547**

Failures
business, analyzed, **78.101**
condominium at Cocoa Beach, **82.90**
design and construction
causes analyzed, **81.641**
reasons/remedies, **82.345**
falsework/shoring, causes, **77.607**
highway ramp in Indiana, **83.422**
information center set up, **82.814**
residential foundations, **81.659**
roof structures, causes, **80.133**
rules for prevention, **81.641**
shoring, **79.572**

Fallacies re. concrete work, common misconceptions, **77.761**

Fallingwater, Frank Lloyd Wright design described, **83.109**

False set, definition, **84.521**

Falsework. *See also* Shoring
failure causes, **77.607**

Family business. *See* Business organization

Farm builder. *See also* Agricultural uses
information resources for, **81.485**
market opportunities, **86.639**

Fast setting materials, pavement repair, **79.177**

Fastening to concrete, types suited to particular kinds of concrete, **83.691**

Fats and oils, effect on hardened concrete, **81.25**

Fences, privacy, precast systems, **83.767**

Ferrocement
ballerina sculpture, **86.214**
boatbuilding, activity, **77.205**
composition and properties, **81.269**
frames stained glass panels, **82.193**
frames stained glass sculpture, **86.547**
history of development, **81.269**
information center, **77.519**
properties and applications, **77.205**
state of the art, **81.269**
tiles with marble finish, **77.624**

Ferrocement boats
houseboat *Floating Stone,* **83.351**
sailboat *Heretic,* **77.336**
sailboat *New Freedom,* **77.337**

Fiber-reinforced concrete. *See also* Glass-fiber-reinforced concrete
impact strength, **77.280**
inverted slump cone test, **85.5**
mixing, placing, and finishing, **85.5**
seismic resistance, beam-column joint, **80.525**
shotcreted for homes, **77.115**
status report, applications, **81.261**
tensile skin for beams, **81.846**

Fiber-reinforced mortar, repair material, **84.893**

Fiber reinforcement
glass
properties and uses, **82.649**
uses in concrete, **81.261**
materials compared, **81.261**
polypropylene
effect on concrete properties, **86.363**
properties and uses, **83.468**
polypropylene effectiveness, **86.749**
polypropylene in floor slabs, **86.371**
steel
collated and crimped, **82.451**
effect on concrete, **77.280, 82.451**
how to mix into concrete, **85.5**
properties and uses, **81.261**
shotcrete, **80.189**

Field bending, reinforcing bars, **83.244**

Finish. *See* Surface finish

Finishing. *See also* Floor finishing
flatwork
aluminum straightedges, **86.40**
backpack vibratory screed for, **85.933**
ornamental, **79.237**
power tools and techniques, **86.795**
residential, **79.231**
timing critical, **79.223**
tools and methods, **79.225, 86.786**
heavy duty floors, **79.231**
lightweight aggregate concrete, **79.231**
problems and remedies, **85.855**

Finishing tools, power trowels, **82.717**

Fire damage to concrete
California apartment house, **79.612**
methods of evaluation, **81.609**

Fire ratings
explained, **79.591**
how determined, **86.633**
how valid?, **79.597**

Fire resistance
code requirements, **79.597**
concrete safeguards low-rise residences, **79.591**
concrete structures, **80.35, 86.633**

Fire stains, removal, **86.736**

Fireplace, precast concrete, **80.839**

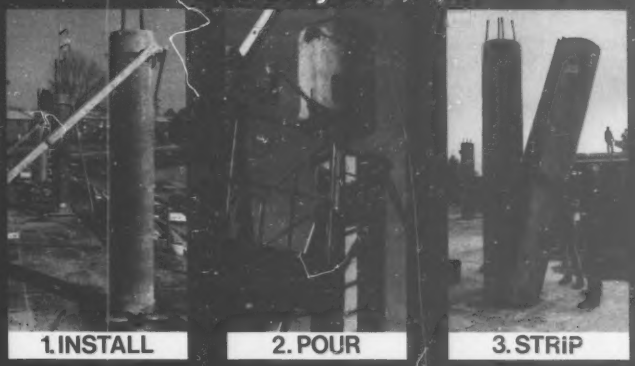
Flame treatment
cleans and roughens concrete, **78.275**
stain removal, **86.539**

Flatwork
correcting color mismatch, **80.446**
curing recommendations, **79.245**
discoloration removal, **86.655**
field study of scaling, **80.139**
finishing recommendations, **79.223, 86.786**
finishing tools, **86.786**
ornamental finishes, **79.237**
pattern stamped, **86.775**
power tools for finishing, **86.795**
residential, requirements for good quality, **85.771**
surface discoloration, causes, **84.767**
surface finish defects, **79.247**

Flexural strength, affected by polypropylene fibers, **86.363**

(more)

MFG One-Piece Round Column Forms are as easy as 1, 2, 3



They're **Easier to use** — lightweight construction makes installing, pouring and stripping a simple task.

Easier to maintain — manufactured of fiber glass reinforced plastic, these forms will not dent, sag, rust or weather.

Easier to ship and store — MFG RCF units nest and, therefore, use less shipping and job site storage space than other types of forms.

- Produces clean, smooth concrete
- Available on a sale or rental basis
- Complete with bracing collar and "fast" bolts
- Designed for multi re-use

For more information on our complete line of MFG Concrete Forms, call us at 800-458-0863 (in PA, 814-438-3841).

MFG MOLDED FIBER GLASS CONCRETE FORMS COMPANY
55 Fourth Avenue • Union City, PA 16438
Toll Free 800-458-0863 • (In PA, 814-438-3841)
West Coast: 4130 Watson Center Road • Carson, CA • 213-549-5063

circle 155 on reader service card

THE FLOOR UNDERLAYMENT OF THE FUTURE, TODAY.

NO SHRINKING • SELF LEVELING
CRACK RESISTANT

U.L. RATED
HIGH STRENGTH
SOUND CONTROL
SATIN FINISH
FAST CURING
NO DETERIORATION
NO SPLASH INSTALLATION
WATER RESISTANT
DUST FREE (FOR TILE)
FAST SETTING
LIGHTWEIGHT
FIRE RESISTANT

COST EFFICIENT • TESTED • APPROVED

FLOOR CRETE

FOR INFORMATION ON ORTECRETE TYPE II OR DISTRIBUTORSHIP OPPORTUNITIES AVAILABLE IN YOUR AREA PLEASE CONTACT:

FLOOR CRETE INDUSTRIES, INC.

CORPORATE OFFICES
5427 Gessner Drive • Houston, Texas 77041 • 713-466-0001
800-533-3998

circle 135 on reader service card

Floating. *See also* Bull floating
flatwork
power equipment and methods, **86.795**
recommendations, **79.225**

Floating dock, precast for Valdez, Alaska, **83.131**

Floats
power, types available, **86.795**
types for flatwork finishing, **86.786**

Floor construction
checkerboard placement, **77.73**
composite concrete/concrete, **86.574**
control for superflatness, **84.291**
curing, **79.74**
curing problems, **80.308**
dusting causes and remedies, **79.735**
jointing practices, **79.33**
methods for superflatness, **86.498**
nonslip by grinding, **79.727**
nonuniform setting problem, **84.425**
power screeds, **79.369**
precast screed rails, stay in place, **84.483**
questions/answers, **79.33**
WOC seminar, **80.232**
ribbed slab above basement, **83.747**
roller-skating rink, **77.489**
shrinkage compensating concrete, **79.110**
slab cast over precast joists, **82.841**
slab over residential basement, forming methods, **85.603**
specification concerns, **81.692**
two-course, **79.40**
vapor barrier effects, **80.232**
warehouse to close tolerances, **77.493**

Floor finishing. *See also* Finishing
bleeding process, **79.36**
dry shake hardeners, **84.285**
grinding for superflatness, **83.254**
grinding method, **79.727**
methods correlated with flatness, **82.865**
problems, **80.304**
robot designed for, **85.887**
roller-skating rink, **77.489**
superflat methods demonstrated, **86.498**
vacuum dewatering, **79.44**
vacuum dewatering plus metallic hardener, **77.73**
vibrating leveling beam, **82.738**

Floor flatness
automatic measuring device, **82.865**
control to strict tolerance, **84.291**
cornflakes test, **81.512**
critical in warehouse, **77.493**
diamond grinding to obtain, **86.952**
F numbers used to evaluate, **86.498**
how to measure, **81.673**
measuring equipment, **86.815**
specifying and measuring, **81.125**
standards for home basements, **86.896**
tolerance change proposed, **83.258**
tolerance recommendations, **85.66**
tolerance specifications, **81.673**
tolerances met by grinding, **85.787**
tolerances proposed, **80.743**

Floor joints
construction of, **84.553**
details and location, **81.117**
purpose and types, **84.553**
shrinkage compensating concrete, **79.110**

Floor slabs. *See also* Slab on grade; Slabs
basics of behavior, facts needed for design, **81.117**
composite with steel beams, forming method, **85.437**
crack control, polypropylene fibers, **86.371**
curing and hardening, **77.25**
design considerations, **81.117**
design for industrial use, **85.13**
dusting, causes and remedies, **85.855**
dusting remedies, **77.141**
formed with precast panels, **85.437**
industrial and commercial, specifying guide, **81.125**
lightweight insulating concrete, **78.411**
moisture measured before covering, **86.472, 86.667**
paint for traffic stripes, **81.204**
reflective, save energy, **83.537**
repair in food freezer, **77.153**
resurfacing and overlays, **77.25**
resurfacing methods, **77.154**
sealing materials, **77.25**
shrinkage and curling, **81.117**
underfloor duct system, **82.639**
warehouse, joint sealants for, **78.331**

Floor slabs above grade, precast hollow core, **86.881**

Floor topping
cracking causes, **86.166**
cracking problems, **86.162**

Floor underlayment, self-leveling, **81.514**

Floors. *See also* Floor slabs; Slab on grade; Slabs
forming system selection, **86.5**

Flowing concrete. *See also* Superplasticizers
formwork precautions needed, **85.763**
mix adjustments for, **85.763**
placing methods, **79.25, 85.763**
produced at batch plant, **85.337**
production and uses, **79.25**

Fluosilicate floor hardener, 84.915

Fly ash
Class C and Class F compared, **85.321, 85.804**
Class C in paving work, **82.422**
classes differentiated, **83.791**
definition, action in mix, **82.417**
detection in fresh concrete, **86.40**
effect on concrete mixes, **81.229**
effect on concrete properties, **85.321**
effect on fresh concrete, **82.417**
effect on hardened concrete, **82.417**
how used in concrete, **82.422**
included in Pennsylvania paving spec, **77.107**
mix design with, **85.321**
solidifies hazardous wastes, **85.781**
suitability for earth-sheltered concrete, **81.216**
usage survey by NRMCA, **86.262**

Flying forms
aluminum truss supported, **78.525, 82.185**
column mounted tables, **84.949**
folded for tapering building, **84.385**
glass-fiber coated, **78.45**
team with slipform on high-rise, **77.597**
truss supported, when to use, **86.5**
tunnel systems for housing, **77.603**

Flying scaffold, work on high walls, **79.29**

Foam, used in cellular concrete, **78.411**

Footing and foundation wall, precast, **79.397**

Footings
early cracking problem, **79.850**
earth-sheltered construction, design, **82.499**

Forecourt Fountain, Portland, Oregon, **77.331**

Forest City Dillon
modular precast with cast in place, high-rise, **84.131**
prison construction with precast panels, **86.145**

Form camber, proper specifications for, **80.199**

Form drawings, safety checklist for, **81.111**

Form hardware, bracket for bridge deck overhang, **83.276**

Form joints
architectural concrete, **78.590**
details and problems, **79.517**
leakproof, needed in architectural concrete, **79.6**

Form leakage, causes blemishes, **79.719**

Form liners
architectural concrete, questions/answers, **78.585**
board and brick patterns for Iowa houses, **83.737**
custom made, costs, **82.567**
elastomeric, how to use, **79.669**
match textile block masonry, Biltmore Hotel, **79.309**
plastic, types compared, **82.51**
questions/answers, **79.531**

Form materials
fabricated wood members for support, **86.449**
panel boards
maximizing reuse, **85.237**
types reviewed, **85.237**
product review—various kinds, **84.445**
questions/answers, **79.511**

Form pressure
controlled placing to reduce, **85.516**
effect of revibration, **78.67**
effect of temperature, **80.501**
factors affecting, **79.538**
values for wall form design, **85.915**

Form release agents. *See* Release agents

Form stripping
box girder, aided by hydraulic ram, **86.318**

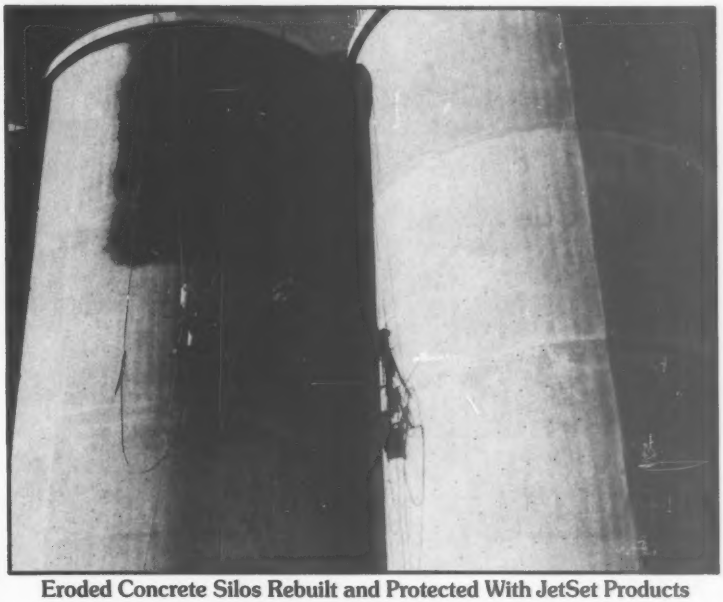
how to specify, **80.199**
plastic lined forms, **82.51**
recommendations, **79.541**
sled holds panels, **85.83**
time based on structural design load, **86.484**
wall forms, residential work, **85.915**

Form ties, 79.515
architectural treatment, **78.600**
cone type with seal, **80.780**
labor costs, **86.21**

Forming machines
cast-in-place pipe, **79.163**
post-tensioned box girders, **84.405**

Forms. *See* Formwork; Glass-fiber-reinforced plastic

Formwork. *See also* Slipforming; Tunnel form system
aluminum panels, patterned for townhouses, **85.597**
arch, shotcreted over expanded metal, **82.581**
architectural, questions/answers, **78.583**
basement construction, **78.199**
basic requirements outlined, **85.847**
board marked concrete, National Gallery of Art, **84.105**
box culvert construction, **86.867**
bulkhead
expanded metal, **83.552, 86.966**
care and maintenance, **79.511**
cast-in-place pipe, **79.163**
chamfer, drip, and rustication
made of vinyl, **84.449**
made of wood, **84.447**
codes and standards regulating, **85.271**
column capital, **85.88**
column forms
cost of round vs. square, **86.478**
design chart, **84.392**
column mounted for slabs, **83.455**
composite slab construction, **85.437**
core, self stripping, **84.446**
cost comparisons for slabs, **86.5**
curb and gutter construction, **86.699**
data, detailed index, **79.508**
design charts
horizontal forms, **84.648**
vertical forms, **84.392**
design standards, **84.648**
dome, made of polystyrene logs, **82.660**
earth mound for arch, **81.978**
fabric. *See also* Formwork, inflated; Inflated forms
bags or mats, **80.401, 86.721**
pile jackets, **80.395**
revetments, **80.395**
tube shaped, **80.401**
false floor built to support shoring, **81.690**
floor
over house basement, **85.603**
supported on precast joists, **82.841**
floor edge forms, aluminum and plywood, **84.291**
floor slab, cycle speeded by preshoring, **86.307**
flying, with folded panels, **84.385**
half tunnel for apartments, **80.535**
historic gravel wall house, Ohio, 1852, **85.571**
hog pen divider, **81.479**
house walls and roof, round GFRP, **85.589**
inflated for barrel shell home, **85.583**
inflated for domes, **78.405, 82.511, 83.247, 85.724**
innovations for tapering high-rise, **84.385**
labor costs, factors affecting, **86.21**
lacing/bracing needs, **84.648**
lettering in concrete, **85.257**
modular for water/waste-treatment plants, **77.615**
modular steel for homebuilding, **78.659**
permanent, small metal for insulated wall, **82.370**
polystyrene blocks, permanent for house walls, **85.599**
precast box girders, machine for, **84.405**
precast panels
stay in place for beams, **86.574**
stay in place for slabs, **82.355**
stay in place for spandrels, **84.949**
prison cells, custom modules, **82.349**
(more)



Eroded Concrete Silos Rebuilt and Protected With JetSet Products

NEW JetSet® Coatings

the quick, cost-effective, permanent way to repair, rebuild, & protect concrete & steel

JetSet Coatings are unique formulations of profoundly cross-linked polymers which are at home in harsh environments and demanding applications...those requiring high resistance to chemicals, abrasion, freeze/thaw cycles, and exposure to ultraviolet. JetSet Coatings are unequaled for adhesion to steel and concrete, and do not shrink or embrittle.

JetSet Coatings are cost-effective too; they solve problem jobs fast where nothing else can. Rapid-cure JetSet Coatings let you get in, get the job done, and get out quickly...many times with no downtime. Below-freezing formulations allow you to work year round in all but the most severe cold weather.

Call or write for information, literature, or product demonstration.

American Chemical Corporation

35555 Curtis Blvd. · Eastlake, Ohio 44094 · (800) 634-1441

Specialty Coatings·Proven Safe·Proven Effective.

circle 111 on reader service card

Formwork . . . continued
release agents for various form materials, **84.417**
ribbed slab for home, over basement, **83.747**
risers for stadium, **83.679**
rustication strips, **79.519**
safety checklist, **81.111**
self-lifting, how it works, **82.173**
skip joist system competes with steel, **81.877**
slab forms
design charts, **84.648**
selecting best system, **86.5**
supported on aluminum trusses, **78.525**
specifications for, **80.199**
stairs, spiral, **85.191**
state of the art for home building, **85.577**
stripping. *See* Form stripping
superplasticized concrete, precautions needed, **85.763**
textured aluminum for homes, **77.272**
tilt-up panel edges, **82.29**
tilt-up panels, to simulate masonry, **84.477**
tolerance considerations, **80.199**
tooled concrete, **84.397**
tunnel construction
Metro, Washington, D. C., **77.263**
tunnel system
construction details, **80.599**
cycles of use, **80.599**
externally vibrated, **82.734**
housing, **77.603**
housing construction cycle, **85.201**
when to use, **86.5**
void forms
materials/methods, **79.525**
over expansive soils, **78.294, 84.657**
self-stripping for shaft, **86.947**
wall forms
cost comparisons, **86.21**
curved, **82.816**
design chart, **84.392**
permanent insulating, **77.599, 80.488**
residential construction, **85.915**
wood lattice girder as strongback, **84.450**
wood members fabricated for support, **86.449**
wood plank for roof, stay in place, **85.613**

Foundations
diagonal distance tables for layout, **80.816**
expansive soil problems, **84.657**
grade beam, steel cover requirement, **85.543**
heaving causes/cures, **81.659**
in-plane drainage systems, **84.955**
precast, wall/footing, **79.397**
settlement causes/cures, **81.659**
slurry wall construction, **77.17**
soil properties and compaction for, **85.681**

Fountain
Forecourt in Portland, **77.331**
precast concrete at Chicago Botanical Garden, **86.35**

Fountain of Time, exposed aggregate sculpture, Lorado Taft, **84.797**

Franchises
cast-in-place pipe, **79.163**
modular precast building system, **80.804**
pattern stamped concrete, **79.451**

Freeze-thaw damage, prevented by air entrainment, **85.351**

Freezing, affected by wind chill?, **86.415**

Freezing damage
effect at early age, **84.821, 85.149, 86.890**

Front discharge ready mix trucks, **84.15**

Fruit stains, removal from concrete, **86.736**

Fusion bonded rebars. *See* Epoxy coated rebars

G

Ganged forms, walls, selecting best system, **86.21**

Gap grading, exposed aggregate concrete, Meridian Hill Park, **84.117**

Geotextiles. *See also* Fabric forms
base for gravel access road, **86.721**

GFRP. *See* Glass-fiber-reinforced plastic

Girders. *See* particular types

Glare screen, tops median barrier, **81.667**

Glass, faceted, framed in mortar or concrete, **78.459, 82.193, 86.547**

Glass fiber
alkali resistance developed, **78.644**
aramid composite with, **82.649**

Glass-fiber-reinforced concrete
polymer modified, **82.649**
precast for farm use, **83.250**
production and uses, **78.644**
properties, **78.644**
properties and uses, **82.649**
renovates hotel facade, **82.664**
wall panels, **79.68**

Glass-fiber-reinforced plastic, forms for lettering, **85.257**

Goldberg, Bertrand, Marina City, **83.89**

Graffiti
coating to resist, **85.362**
prevention with urethane coating, **77.485**
removal from concrete, **86.736**

Grass, grows in formed voids of pavements, **77.216**

GRC. *See* Glass-fiber-reinforced concrete

Grease stains, removal from concrete, **86.736**

Grinding
definition, **83.47**
diamond blade
history of use, **86.952**
where to use, **86.952**
floor finishing method, **79.727, 83.254**
floors to meet tolerances, **85.787**
repair applications for, **77.136**
smooths pavement surfaces, **81.210, 83.13**
tools and techniques, **81.49**

Groovers, types available, **86.786**

Grooving
dairy barn floors for skid resistance, **83.277**
definition, **83.47**
improves pavement skid resistance, **77.136, 80.840, 83.619**
percussive for runways, **82.309, 82.611**
tool for finishing dairy barn floors, **80.842**
tool for wide slab, **86.819**
tools and techniques, **81.49**
transverse vs. longitudinal, **85.293**

Grout
bonds resurfacing courses, bridge deck, **78.323**
cleandown, architectural concrete, **79.319**
nonshrink term challenged, **85.213**
post-tensioning tendons
admixtures for, **84.47**
bleeding reduced, **85.876**
properties needed, **83.337**
repair uses, **81.31**
shrink resistant, **84.893**

Grout bags, provide bearing for strengthened bridge, **79.675**

Grout leakage, architectural concrete, **79.6**

Grouting
post-tensioning tendons, **83.337**
repair applications for, **77.139**
seal for earth-fill dam, **77.393**

Guggenheim Museum, design and construction, **83.137**

Guideways, post-tensioned box girder, construction, **84.405**

Gypsum plaster stains, removal from concrete, **86.736**

H

Handling concrete. *See also* specific methods
methods and equipment, **85.847**

Hardboard, use as form material, **85.237**

Hardeners, floor surface application, **85.445**

Hartsfield Atlanta Airport, architectural concrete, **82.8**

Havill, Jeff B., sculptor uses thin mortar shell, **77.313**

Hayde, Stephen J., patents lightweight aggregate, **85.519**

Hazardous waste, solidified with portland cement, **85.781**

Hazardous waste containment, soil cement layer, **84.662**

Heating, systems embedded in slab, **86.561**

Heating concrete mix, winter techniques, **84.789**

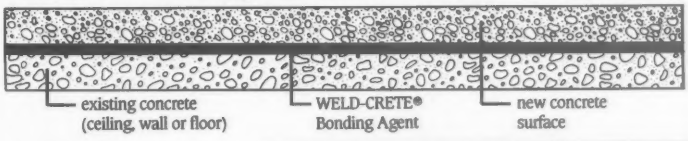
Heavyweight concrete. *See* High density concrete

Helicopter
delivers dry concrete mix, **82.732**
delivers reinforcement, **81.432**

Helicopter landing pad, precast panel construction, **77.282**
High alumina cement. *See* Calcium aluminate cement
High density concrete, aggregate sources for, **81.229**
High iron oxide cement, saves manufacturing energy, **78.112**
High-rise construction
architectural shear walls, **82.571**
concrete strengths used, Metropolitan Tower, **86.859**
concrete vs. steel, **77.425**
flying forms, **78.45**
frame shortening, design for, **83.31**
Metropolitan Tower, New York, **86.859**
preshoring and reshoring cycles, **86.307**
slipform plus flying forms, **77.597**
High-rise office buildings
concrete vs. steel, factors to consider, **81.896**
marketing permanent panel form system, **81.877**
redesigned with skip-joist forming, **81.877**
High strength concrete
entraining air in, **77.77**
how to produce it, **80.222**
how to test for strength, **80.222**
importance of fly ash, **85.321**
lightweight in precast columns, **85.497**
materials needed for, **80.222**
materials selection for, **77.77**
mix design using fly ash, **81.241**
polymer/polymer impregnated, **79.13**
properties in Chicago, **81.241**
quality control, **81.241**
small test cylinders?, **83.500**
testing procedures, **77.77**
use at Water Tower Place, **83.93**
High temperature, repair techniques, **79.412**
Highways. *See also* Paving; Pavements
toll vs. freeway, public opinion, **86.322**
History. *See also* Record setters
aqueducts and pipes, **85.280**
Baha'i Temple (Illinois), **83.119**
Bellefontaine pavement, designated landmark, **77.20**
Black Hawk sculpture, 1910, **84.299**
cement, in Book of Mormon, **82.457**
cement production, **81.204**
Christian Brothers winery, **80.246**
Concrete Construction magazine, **81.753**
concrete pipe sewer, **83.340**
early roadbuilding, **83.275**
ferrocement development, **81.269**
fly ash at Hungry Horse Dam, **82.390**
Fountain of Time, exposed aggregate, **84.797**
gravel wall house, Ohio, 1852, **85.571**
houses built in 1918, **82.218**
Interstate Highway System, **81.753**
landmarks from 5600 B.C. to 1963, **81.1024**
lightweight aggregate concrete, **85.519**
mansion in Wales, 1924, **83.643**
mass concrete placement, **82.389**
Mercer Mile buildings, 1910, **82.561**
Meridian Hill Park, exposed aggregate, **84.117**
Mount Vernon Memorial Parkway, construction, **84.137**
National Building Museum, **81.910**
Nervi and ferrocement, **79.175**
no-fines concrete, **79.123**
Panama Canal construction, **78.56, 86.863**
prestressed concrete, **80.125**
reinforcing steel, trade associations, **81.830**
river god statue, England, **82.600**
Roman concrete uses, **85.519**
Saint Peter's Basilica in Rome, **86.455**
Saylor Park cement museum, **77.456**
sidewalk construction, 1895, **82.218**
Statue of Liberty base, **81.698**
Stonehenge replica is war memorial, **85.443**
Taft Bridge, 1907, **82.304**
truck and transit mixer deliver concrete, **82.98**
Unity Temple design, **86.807**
vibration of concrete, **82.306**

(more)

Your easy A-B-C BLUEPRINT for concrete bonding with delayed timing



LARSEN WELD-CRETE®
bonds concrete to

- EXISTING CONCRETE
- BRICK, BLOCK & STUCCO
- METALS, INCL. LEAD
- CLAY & CERAMIC TILE
- MARBLE, GLASS, ETC.

WELD-CRETE® has the delayed bonding time you need—hours, days or weeks.

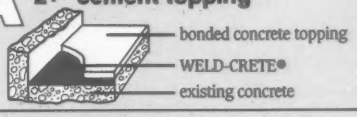
WELD-CRETE® is easy to apply—by brush, spray or roller to vertical or horizontal surfaces. It contains no volatile organic solvents, is non-toxic, vermin proof and unaffected by alkali or acids.

LARSEN PRODUCTS CORP

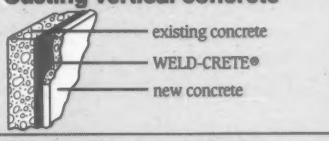
Originators of leading chemical bonding agents for over 30 years

5420 Randolph Road, Rockville, MD 20852. 301/770-5200 or 800-633-6668

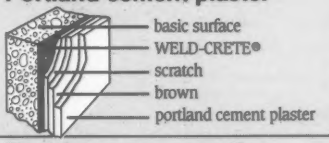
A Concrete floor with ½" to 2+" cement topping



B Casting vertical concrete



C Portland cement plaster



Performance properties

PROPERTY	TEST METHOD	RESULT
Tensile Bond Strength	ASTM C-190 Pulling apart neat portland cement briquet halves bonded together.	385 psi. Avg. 28 days. In all cases failure occured in the cementitious material, not within the bond.
Flexural Bond Strength	ASTM C-78 Concrete beams laminated with bonding agent	603 psi. Avg.
Fire Resistance	ASTM E-119 Bonded assembly.	Passed 2-Hour Fire Test & 1-Hour Hose Stream Test

circle 144 on reader service card

History . . . continued
Washington Monument foundation, **82.600**
World War I ships of concrete, **85.519**
World of Concrete growth, **82.845**

Hog houses
earth-sheltered, **83.229**
earth-sheltered/solar heat, **83.241**

Hog pen dividers, forms for casting in place, **81.479**

Hollow core slabs, precast floors above grade, **86.881**

Home building. *See* Residential; Houses

Honeycomb
architectural concrete, prevention, **79.323**
patching method, **80.219**
reasons and remedies, **77.450**

Hood Canal Bridge, anchors for pontoons, **82.800**

Hoover Dam, history, **81.1037**

Hose. *See* Pump hose

Hot weather, cylinder test results affected by, **86.15**

Hot weather concreting
checklist of good practices, **83.381**
cooling and mixing practice, **84.508**
cooling methods, **79.359**
liquid nitrogen for cooling, **77.257, 80.606, 83.391**
mix designs for, **79.359**
solving slump loss problems, **82.429**
temperature control, **77.267**

Houses. *See also* Residential
builders and building methods listed, **85.613**
cast-in-place cabin, built by owners, **85.675**
cellular precast panel walls, **85.584**
concrete construction, state of the art, **85.577**
dome shotcreted inside urethane layer, **85.724**
earth-sheltered, single 126-yard pour, **85.593**
earth-sheltered dome modules, **85.603**
historic gravel wall home, Ohio, 1852, **85.571**
inflated form shapes foam/shotcrete dome, **83.737**
insulated precast panel construction, **85.601**
Japanese has round windows, **83.135**
Lawson home in Utah, CRSI award winner, **86.887**
log cabin simulated in concrete, **86.1162**
marketing concrete construction for, **85.565**
patterned precast insulated panels for, **85.603**
polystyrene blocks are permanent form, **85.599**
polystyrene foam encases concrete, **85.580**
polystyrene shell, base for shotcrete, **86.874**
precast insulated panel, **83.737**
precast panels enclose foam insulation, **85.676**
precast twelve-sided, **85.581**
prestressed double tee construction, **85.585**
round, cast in place on pedestal, **85.589**
shotcrete over expanded metal, earth covered, **82.43**
shotcreted barrel shells, inflated forms, **85.583**
shotcreted dome modules, earth-sheltered, **85.598**
steel-fiber-reinforced concrete, Australia, **78.659**
tilt-up insulated panels for, **85.621**
walls cast in place with insulation core, **83.737**
walls shotcreted over polystyrene core, **85.592**

Houston Ship Channel Bridge, segmental box girder record, **83.115**

Hubert Humphrey Metrodome, riser formwork, **83.679**

Humor, concrete anchor for basketball hoop, **84.589**

Hungry Horse Dam, fly ash use, **82.390**

Hydraulic ram, aids box girder slab form stripping, **86.318**

Hydroxides, effect on hardened concrete, **81.25**

Hydroxylated carboxylic acid, water reducer, **79.383, 85.333**

Hypochlorite, cleaning solution preparation, **86.961**

I

I-beams, wood, fabricated to support forms, **86.449**

Ice, cooling concrete, calculations, **79.359**

Ice cream stains, removal from concrete, **86.736**

In-place evaluation, classified service listing, **84.1102**

In-place testing, methods summarized, **84.1097**

Indexed data sources. *See Concrete Construction*

Indianapolis speedway, concrete buildings to resist fire, **86.633**

Industrialized building. *See* Building systems

Industry organizations. *See* Associations

Inflated forms
dome of foam plus shotcrete, **78.405, 82.511, 83.247, 85.724**
shape shotcreted barrel shell home, **85.583**

Ingalls Building, first concrete skyscraper, **81.1034**

Ink stain, removal, **79.635, 86.736**

Inlaying, full depth pavement replacement, **85.413**

Inspection, guidelines for post-tensioned concrete, **83.317**

Insulated sandwich panels, prestressed tee section, **81.509**

Insulating concretes
precast wall panels for homes, **85.584**
R values tabulated, **85.139**

Insulating foam blankets, mass concrete, **82.787**

Insulation. *See also* Thermal lag
core for shotcreted walls, **78.279**
curved panel centered in wall, **80.482**
earth-sheltered construction, **82.521**
installation, **80.665**
types and properties, **80.665**
types compared, **81.536**
economies with concrete, **83.525**
exterior, maximizes thermal lag effect, **78.393**
integrated into house walls, **83.737**
lightweight concrete as, **83.543**
optimum amount for walls, **79.677**
perimeter of slab on grade, **78.21**
permanent form panels, have voids for concrete, **77.599**
polystyrene blocks, permanent wall forms, **85.599**
polystyrene shell base, shotcreted home, **86.874**
polystyrene types compared, **81.62**
poured between concrete wall planks, **83.249**
serves as permanent wall form, **80.488**
serves as permanent wall form for home, **85.580**
tilt-up walls, **78.407, 85.511**
types for concrete walls, **83.550**
urethane foam pumped between wall panels, **85.676**
urethane sprayed on precast walls, **78.807**
urethane/wire panels back shotcrete, **80.148**
wall panels for prison construction, **86.145**
ways to build into concrete walls, **83.554**

Insurance costs, workers compensation, general liability, **85.118**

Insurance planning, liability coverage, **86.194**

Iodine stains, removal, **86.736**

Isolation joints. *See* Joints, isolation

J

Jacketing, repair method, **81.31**

Javelle water, how to make, **86.961**

Jitterbug (tamper), finishing flatwork, **86.786**

Joint details, residential flatwork and walls, **86.561, 86.834, 86.836**

Joint sealants
depth needed in pavements, **84.250**
industrial floor needs, **78.331**
leak repair of precast roof, **80.80**
pavement
how to install, **84.579**
last 5 years or more, **83.33**
needs specified, **77.433, 84.579**
premolded foam, **78.670**

removal of excess from concrete, **86.330, 86.736**
shape factor, **83.357**
shape factor significance, **77.433**
silicone stops bleeding asphalt, **84.748**

Joints. *See also* Control joints; Expansion joints
bridge deck (precast), epoxy filled, **86.36**
closure and seal between bridge sections, **85.659**
control, residential flatwork and walls, **86.561**
control and expansion, maximum spacings, **80.167**
control and isolation, slabs, **84.553**
control in bikeways, **78.103**
definition of types, **86.561**
expansion, saw cut 54 inches deep, **85.743**
floor slab, **79.33**
how to build, **84.553**
questions/answers, **80.234**
with permanent screed rail, **84.483**
hand tools for making, **86.786**
isolation, residential walls and flatwork, **86.561**
leakage repair, urethane foam, **84.594**
maintenance needs, **81.9**
pavement
cleaning and resealing, **83.13**
design guide, **83.401**
restoring load transfer, **83.13**
reinforcement splicing at, **85.23**
sidewalk requirements, **86.160**
slab on grade, irregular shapes, **86.391**
spacing and layout in slabs, **84.553**
spacing in industrial slabs, **85.13**
tooled in wide slab, **86.819**
waterstop installation in, **84.569**

K

Kelly-Vail test
cement and water content, fresh concrete, **77.427**
warning on use, **77.513**

Kentucky Horse Park, architectural concrete uses, **80.470**

Kevlar fibers, reinforcement properties, **81.261**

Keyways, standardization of half rounds proposed, **82.820**

L

Laboratories. *See* Testing laboratories

Landscaping vegetation, earth-sheltered construction, **80.653**

Laser construction tools, types and uses, **78.516**

Lateral pressure. *See* Pressure; Form pressure

Latex emulsion paints, properties and uses, **81.406**

Latex modified concrete
batching and mixing, **84.889**
benefits and uses, **78.107**
bridge deck overlay, **80.258**
corrosion resisting overlay, **84.503**
mixing/placing methods, **82.641**
properties, **81.229**
renovation at Soldier Field, **82.641**
repair uses, **81.31, 84.889**

Lattice girders, wood, fabricated to support forms, **86.449**

Layout
construction site, laser instruments for, **78.516**
parking area stalls, aisles, **82.269**

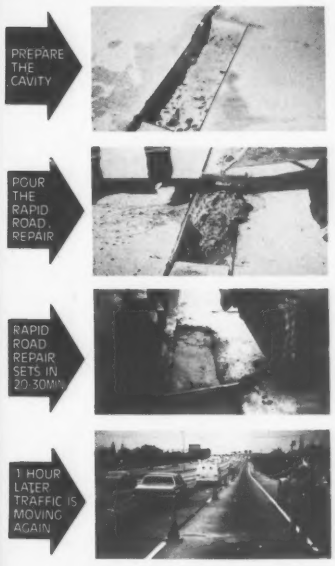
Lead, in aggregate retards set, **77.237**

Leakage, waterstops, repair, **84.594**

Legal cases
children's summer jobs, **79.398**
claims against owner, **86.222**
complimentary bidding, **79.338**

(more)

Another PERFORMANCE PROVEN product from QUIKRETE Construction Products



RAPID ROAD REPAIR™

Gets traffic moving again within an hour of repairs.

Here's a fast-setting, high-strength concrete patching compound that sets in 20 to 30 minutes. Glass fibers and a unique combination of special cements impart high flexural strength. Performance-proven to withstand the rigors of freeze-thaw cycles and provide a permanent repair for the life of the pavement. Government durability tests show "no significant signs of deterioration" after more than five years of use.

Get details on all these QUIKRETE Construction Products:

Non-Shrink Grout
Fast-Set Underlayment
Quick-Setting Cement
Anchoring Cement
Waterproof Masonry Coatings
Hydraulic Water-Stop Cement
QUIKWALL® Surface-Bonding Cement
Stucco Finish Coat
Concrete Bonding Adhesive
Concrete Acrylic Fortifier
Tile Grouts and Thin-Set Mortar
Self-Leveling Floor Resurfacer

QUIKRETE® CONSTRUCTION PRODUCTS

1790 Century Circle NE, Atlanta, GA 30345 • 404/634-9100

circle 167 on reader service card

New Slab Beam FORM Systems

More Economical Than Conventional Beam Forming Systems

Rugged Steel Form

Removable—Reusable

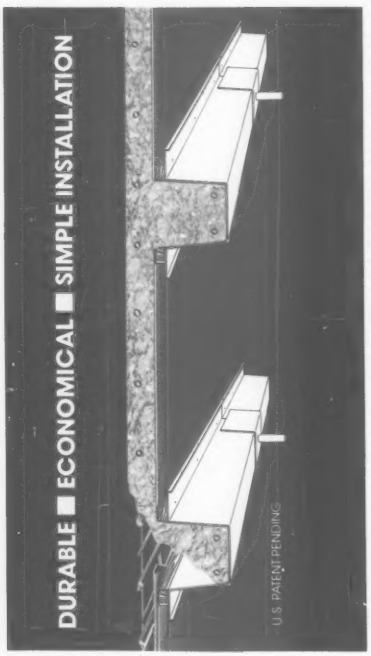
Used With Conventional Type Scaffolding

Fast Easy Construction of Concrete Beams and Slab

Greater Freedom For Design

Achieve Longer Spans Over Other Poured Slab Forming Systems

Use With Epicore Composite Floor Deck To Provide a Permanent Hanger System



DEALER INQUIRIES INVITED
CONTACT

EPIC METALS CORPORATION
Eleven Talbot Avenue, Rankin, PA 15104
Phone: 412/351-3913
TWX: 710-664-4424
EPICMETAL BRDK

circle 128 on reader service card

Legal cases . . . continued
damages for speeding up construction?, **86.178**
defective specifications, **79.624**
interpreting "or equal" specifications, **85.524**
liability insurance limits, **80.840**
mideast Islamic-based law, **80.320**
oral supply contracts, **79.754**
quantity overruns and underruns, **86.236**
specification interpretations, **85.379**
weather log documents delay, **79.188**
whose contract interpretation prevails?, **80.436**
work stoppage, **80.572, 85.704**

Lettering
forming methods for cast-in-place, **85.257**
inscribed in hard concrete, **77.365**
stamped in fresh concrete, **80.503, 85.966**
stamped or cast in concrete, form sources, **86.745**

Liability
construction failures, **82.345**
insurance coverage for, **86.194**
suits, record keeping aids defense, **78.39**

Lift slab
bond breaker, choosing and using, **77.547**
jacking equipment, **86.115**
method explained, **86.115**
used in Middle East, **78.310**
walls unfold as stack rises, **77.90, 81.717, 85.603, 86.115**

Lightning damage
mechanism explained, **84.413**
pavement surface, **77.117**
potholes, **84.413**
research program simulates, **84.413**

Lightweight aggregate concrete
bridge redecking and widening, **85.667**
Chesapeake Bay Bridge, performance, **85.667**
finishing, **79.231**
history of development, **85.519**
materials, mix design, **81.247**
mix design for bridge deck, **85.667**
mix design for pumping, **85.505**
physical properties, **81.247, 85.497**
pumping methods, **85.505**
structural uses described, **85.497**

Lightweight concrete
bridge applications studied, **86.508**
insulation and fill uses, **81.253**
physical properties, **81.253**

Lightweight insulating concrete
floors and roofs, properties and production, **78.411**
roof deck, **78.230**
types and properties, **83.543**

Lignin, water reducing admixture, **79.383**

Lignosulfonates, water reducers, **85.333**

Lime, dries out muddy site, **85.366**

Limestone simulated by precast, 85.868

Linseed oil scaling prevention, bridge decks, **78.290**

Litigation. *See* Legal cases

Livestock feeding floors, slotted, cast in place, **83.235**

Load cells, measure reshore loads, **77.83**

Log cabin, simulated in concrete, **86.1162**

Low density concrete. *See* Lightweight concrete

Low strength cylinders
causes, **85.855**
causes during hot weather, **86.15**
temperature influence, **86.416, 86.502**

Lunar materials, build station in outer space, **85.94**

LUTH tower, construction in Malaysia, **85.100**

M

Machine tool structures, made of concrete, **80.221**

Magnesium chloride, attacks hardened concrete, **82.876**

Magnesium phosphate cement
properties and uses, **81.331**
repair work with, **79.412**

Magnesium phosphate concrete, fast setting repair, **79.177**

Magnetite aggregate, heavy shielding concrete, **78.380**

Maintenance. *See also* Cleaning
joints and surfaces, **81.9**
necessary to life of concrete, **81.7**

Management. *See* Business organization; Marketing, etc.

Manure storage, concrete structures for, **86.639**

Marina City
construction practices, **83.89**
design considerations, **80.135**

Marine concrete. *See also* Ocean structures
inspection guide for vessels, **82.679**

Marketing
concrete alternate to asphalt paving, **85.479**
contractor's use of office brochure, **83.623**
earth-sheltered construction, **82.73**
homes built of concrete, **85.565**
how to organize department, **84.39**
lack of concrete promotion, **79.439**
making concrete competitive, **84.803**
mobile concrete display helps, **85.80**
needed in concrete industry, **77.213**
Ontario reaches for farm builders, **81.499**
parking lot promotion, **81.901, 83.255**
pattern stamped concrete, **79.451**
planning for construction company, **81.889**
programs developed for parking lots, **82.279**
promotion, whose responsibility?, **85.679**
promotion of high-rise building package, **81.877**

promotion to farm users, **81.465**
ready mix producer generates demand, **85.61**
retail concrete store, **82.206**
role of field staff, **84.974**
street paving opportunities, **86.648**
use of signs and graphics, **84.974**

MARTA, segmental box girder bridges, **86.935**

Mass concrete. *See also* Dams
insulating blankets, **82.787**
roller compaction method, **82.709**
temperature control, **77.267, 79.497**

Master Builders, new headquarters built, **78.362**

Material handling. *See* Transporting; Pumping; Conveying; etc.

Mechanical tooling
architectural surfaces, **78.599**
formwork design for, **84.397**
workmanship standards, **82.39**

Median barriers
glare screen added, **81.667**
rental service, **80.244**
safe placement for traffic control, **85.291**
save lives and property, **79.72**
slipformed, heavy design, **81.1041**

Membrane waterproofing, earth-sheltered construction, **80.669**

Mercer, Henry Chapman, museum and home, c. 1910, **82.561**

Meridian Hill Park, exposed aggregate concrete, **84.117**

Metaphor, The, concrete sculpture in Utah, **86.747**

Methyl methacrylate. *See* Acrylics; Acrylic concretes

Metric system. *See* Metrication

Metrication
adoption urged, **77.429**
Australian experience, **77.429**
conversion factors, **77.724**

Metropolitan Atlanta Rapid Transit, concrete usage, **82.8**

Metropolitan Tower, high-rise construction, **86.859**

Mexico City, earthquake damage, 1985, **86.379**

Michelangelo, architect for Saint Peter's dome, **86.455**

Microsilica. *See also* Silica fume
effect on concrete properties, **85.327**
mix design using, **85.327**
terminology controversy, **86.338**
used in drilling platform concrete, **85.497**
uses for concrete containing, **85.327**

Mildew. *See* Mold

Milling machines. *See* Scarifiers

Milwaukee, pavement durability experience, **85.431**

Ministorage warehouses, tilt-up construction methods, **85.511**

Mix design
ACI standard revised, **82.666**
adjustment for aggregate moisture, **86.669**
adjustments for fly ash and admixtures, **85.833**
affected by temperature, **77.267**
affected by water reducing admixtures, **85.333**
aggregate moisture determination for, **86.329**
architectural concrete, **79.6**
architectural concrete repairs, **86.623**
causes blemishes in formed surfaces, **79.719**
changes when using fly ash, **82.422**
colored concrete, National Gallery of Art, **84.105**
effect of superplasticizers, **85.337**
effect of water reducers, **79.383**
electrically conductive concrete, **80.411**
evaluation and consulting service, **81.208**
expansive cement concrete, **86.172**
flowing concrete, **85.763**
fly ash changes proportions, **85.321**
gap grading for architectural work, **78.579**

(more)

6800-square-foot warehouse floor leveled with ARDEX K-500 at ½ inch depth in one morning.
New floor in one morning– flat!
Minimize downtime with ARDEX K-500 self-leveling, pumpable concrete topping!
ARDEX K-500 Self-Leveling Concrete Topping can be easily installed manually with a three-man crew, or pumped on large jobs with the ARDEX Levelcraft Automatic Mixing Pump. Just pour or pump and spread ARDEX K-500 from ¼ inch to 1½ inches in one application.
No troweling required! ARDEX K-500 levels itself automatically...can be walked on in 3 hours, coated in 24 hours, and driven over in 48 hours!
ARDEX K-500 has a compressive strength of 5300 psi. It is ideal for warehouses, garages, and utility areas—for new construction or renovation, on or below grade. For technical data and local availability, contact ARDEX, INC., 630 Stoops Ferry Road, Coraopolis (Pittsburgh), PA 15108; phone (412) 264-4240.
ARDEX
Flatly Superior.
circle 113 on reader service card

Mix design . . . continued
high strength concrete, with entrained air, **77.77**
how materials affect air content, **84.717**
influenced by superplasticizers, **82.409**
input from floor finisher, **86.500**
lightweight aggregate concrete, bridge deck durability, **85.667**
methods of calculation, **85.833**
microsilica concretes, **85.327**
mortar content determination, **86.139**
pumped lightweight aggregate concrete, **85.505**
pumpers need to understand, **82.721**
residential basements, **78.199**
roller compacted concrete pavements, **86.287**
seawater concrete mixes, **86.401**
steel-fiber-reinforced concrete, **85.5**
superplasticizer trouble in low sand mix, **86.160**
tremie concrete, **86.943**
tremie placement requirements, **86.123**
workability vs. water content, **80.339**
yield determination, **86.313**

Mixers
drum and pan type, rubber liners for, **78.341**
mobile batcher type, **84.5**

Mixing practices
effect on air content, **84.717**
hand labor in Indonesia, **81.597**

Mixing silos, supply concrete to pumps, **78.97**

MLC Center (Australia), construction to 808 feet, **83.95**

Mobile batcher mixers
case histories of use, **84.5**
where and how to use, **84.5**

Moisture measurement
floor slab before covering, **86.472, 86.667**
hardened concrete, **77.234**

Moisture meter. *See* Moisture measurement

Moisture movement, resisted by quality concrete, **81.305**

Moisture problems, slab on grade, **78.21**

Mold (mildew)
removal from concrete, **86.736**
removal from old buildings, **84.58**

Molds. *See* Formwork

Mortar
dry pack or plastic, repair uses, **81.21**
fiber-reinforced, shrink resistant, **84.893**
repair uses, **81.31**
shrink resistant, **84.893**

Mortar and cement stains, removal from automobiles, **78.79**

Mortar content
calculated for fresh mix, **86.139**
effect on concrete properties, **86.139**

Mortar stains, removal from glass, masonry, **77.129**

Moscone Convention Center
design and construction, **83.103**
foundation mat, **80.64**

Moss, removal from concrete, **86.736**

Mount St. Helens, volcanic ash properties, **80.813**

Mount Vernon Memorial Parkway, historic pavement, **84.137**

Mudjacking. *See* Slabjacking

Mudsills, inadequate cause shoring failures, **77.607, 81.641**

N

Nailable concrete, 83.574

Nassaux, Frederic A., sculpture in ferrocement, **86.214**

National Building Museum, opened, **81.910**

National Bureau of Standards, concrete laboratory accreditation, **86.731**

National Gallery of Art, design and construction, **84.105**

Naturbetong, 82.575

Neill, T. J., sculpts animal and human figures, **86.218**

Nervi, Pier Luigi, development of ferrocement, **79.175, 81.269**

Netherlands surge barrier
built of precast concrete, **83.661**
construction progress, **86.898**

New River Gorge Bridge, concrete deck for, **78.220**

Nitrogen (liquid)
cools concrete, **77.257, 79.359, 80.606, 83.391**

No-fines concrete
insulates and saves energy, **83.539**
mixing and placing, **79.123, 83.685**
porous floor for drainage, **80.620**
properties and uses, **83.685**
residential walls, **79.123**

Noise control
compressors and breakers, **79.50**
precast barrier wall/fence, **83.767**
precast barriers at Heathrow, **86.396**

Noise resistance, wall types compared, **79.375**

Nondestructive testing
acoustic method, finds voids in fresh concrete, **83.839**
criterion for form removal, **80.199**
pulse-echo method, finds internal flaws, **86.129,**
rebound hammer, **80.421**

Nonexplosive demolition, 82.366

Nonmagnetic reinforcement
cost considerations, **78.544**
materials available, **78.311**

Nonshrink. *See* Shrinkage compensating

Nozzleman, shotcrete, skills needed, **81.641**

Nylon fibers, reinforcement properties, **81.261**

O

Occupational Safety and Health Act. *See* OSHA

Ocean structures
deep test spheres, **77.453**
floating dock at Valdez, precast construction, **83.131**
floating ocean thermal energy station, **82.877**
lightweight concrete drilling platform, **85.497**
research program by naval laboratory, **83.409**
surge barrier in Netherlands, **83.661, 86.898**

Ocean thermal energy, concrete structures used to recover, **82.877, 83.537**

Offshore structures. *See* Ocean structures

Oil stains, removal method, **82.386, 84.844, 86.821**

Olson, Lynn, concrete sculpture, **82.193, 86.547**

OSHA
formwork regulations, **85.271**
handling inspections, **82.333**
new rules proposed for concrete, **85.944**
trenching regulations, **86.556**

Overlays
bonded or unbonded, repair methods, **81.31**
bridge deck, thin bonded, **84.711**
parking lot, whitetopped with concrete, **85.425**
pavement
bonded and reinforced, **82.291**
bonded and unbonded, **85.413, 86.439**
design considerations, **85.413**
partially bonded, **85.413**
post-tensioned for O'Hare runway, **82.261**
specialty mixes for corrosion protection, **84.503**

P

Paddleboat, ferrocement construction, **82.957**

Paint
application recommendations, **77.145**
floor, performance evaluated, **86.680**
preparing concrete for, **77.481, 81.401**
removal from concrete, **86.821**
types used on concrete, **81.406**

Pan mixers, rubber liner for, **78.341**

Panama Canal
concreting practices, **86.663**
construction overview, **78.56**

Pantheon, Roman construction, 124 A.D., **85.519**

Parking decks
designed for durability, **77.387**
epoxy repair, **79.278**
expansion joint failures, **81.651**
post-tensioned for Southwestern Bell, **83.344**
prestressed concrete framing, **77.387**
state of the art in ACI report, **86.76**

Parking lots
concrete surface saves lighting energy, **83.535**
design considerations, **82.243**
design practices, **77.221**
getting quality with less effort, **82.243**
layout and design, **82.269**
marketing programs, **82.279**
marking and signing, **82.269**
McDonalds uses 2.8 acres of concrete, **86.586**
porous no-fines concrete, **83.685**
promotion campaign, **81.901, 83.255**
standards for paving, **86.647,**
whitetopping over asphalt, **85.425**

Parrott's Ferry Bridge, 80.157
lightweight aggregate concrete used, **85.497**

Passive solar. *See* Solar energy

Patching. *See also* Repair
questions/answers, **77.149**
when not to do it, architectural concrete, **86.623**

Pattern stamped concrete, 79.237
coloring methods, **86.775**
cost data, **86.775**
franchisers and toolmakers, **79.459**
how to do it, **79.441**
jointing methods, **86.775**
market development, **79.451**
methods for residential work, **83.765**
methods of installation, **86.775**
tools and systems available, **79.441, 86.775**
wheel-shaped tool, **80.197**

Pavements. *See also* Paving blocks
asphalt vs. concrete, **82.293, 82.647**
AASHTO design guide, **83.179**
design standards, **86.648**
cost comparisons, **86.463, 86.838**
equivalent sections, **82.269**
concrete saves petroleum, **81.657**
concrete shoulders extend life, **78.509**
continuously reinforced overlays, **78.655**
design standards for city streets, **86.648**
design with interlocking blocks, **86.105**
dowel bars, automatic setters, **82.253**
fast-setting repair methods, **79.177**
grass grows in formed voids, **77.216**
grinding-grooving smooths surfaces, **83.13**
grooved for skid resistance, **83.619**
historic Mount Vernon Parkway, **84.137**
inlaying (full depth replacement), **85.413**
joint cleaning and resealing, **83.13**
joint design guide, **83.401**
joint sealants, **77.369**
installation, **84.579**
last 5 years, **83.33**
materials specifications for, **77.433**
life cycle cost analysis, **86.463**
marketing for city streets, **86.648**
overlay, design, **85.413**
overlay for restoration, **78.538, 86.439**
recycled as aggregate, **80.725, 83.539, 85.413**
recycling methods, **82.62**
reinforced bonded overlay, **82.291**
restoration programs of FHWA, **85.413, 86.439**
restoration with CPR system, **83.13**
restoration with diamond grinding, **86.952**
roller compacted concrete, performance record, **86.287**
scaling prevention methods, **85.431**
service life longer for thicker sections, **85.456**
serviceability evaluation, **85.413**
slipform equipment, **86.439**
steel-fiber-reinforced, installations listed, **77.143**
surface tolerance measurements, **86.439**
thickness design for parking areas, **82.269**
thickness design methods, **85.456**

Pavers. *See also* Paving blocks; Paving machines

Paving
black concrete in Manhattan, **83.461**
cost of typical sections compared, **77.545**

(more)

circle 134 on reader service card

Paving . . . continued
curb and gutter construction, **86.699**
demonstration by ACPA, **77.545**
farm requirements, **86.639**
granular subbase function, **86.647**
industry problems cited, **82.241**
manual methods using prison labor, **85.527**
marketing concrete alternate to asphalt, **85.478**
methods applied to tilt-up, **77.37**
methods on Manhattan 3-mile project, **83.461**
muddy site dried with lime, **85.366**
parking lot requirements, **86.647**
parking lot whitetopped, **85.425**
quality with less effort, parking lots, **82.243**
roller compacted concrete, installation and mixes, **86.287**
stiff resurfacing mixes, **78.323**
vibrating screeds used, **82.284**

Paving blocks
colored concrete, **82.374**
set without mortar, **82.818**
types available, **83.761**
design considerations, **86.105**
installation methods, **83.761, 86.105, 86.566**
specifications for, **86.105**

Paving machines, roller compacted concrete pavements, **86.287**

Paving technology, progress, future growth, **82.255**

Peachtree Center Hotel, design features, **83.97**

Pei, I. M., National Gallery of Art, East Building, **84.105**

Penetration resistance test, methods, **81.[illegible]1**

Perlite concrete
insulating value, **83.543, 85.139**
properties and production, **78.411**
properties and uses, **81.253,**
roof insulation, **83.559**

Perlite plaster, **77.153**

Permafrost subgrade, slab construction on, **82.780**

Permeability
affected at −200C, **84.376**
moisture through concrete, **81.305**
simplified test for, **84.167**

Perspiration stains, removal from concrete, **86.821**

Petrographic analysis, hardened concrete, methods/applications, **81.565**

Phenolic paints, properties and uses, **81.406**

Photography
record keeping at jobsite, **78.39**
time-lapse cameras, **78.39**

MONTH OF PUBLICATION?
PAGE NUMBERS are shown with year of publication, for example **86.504**. Use the table on page 878 to find the month in which an article appeared.

Picasso, Pablo, *Bust of Slyvette,* protected from acid rain, **83.50**

Pier caps, efflorescence removal and repair, **80.561**

Piles
mechanical splice for, **82.96**
repair
in sea water, **82.124**
jacketed with fabric forms, **80.395**

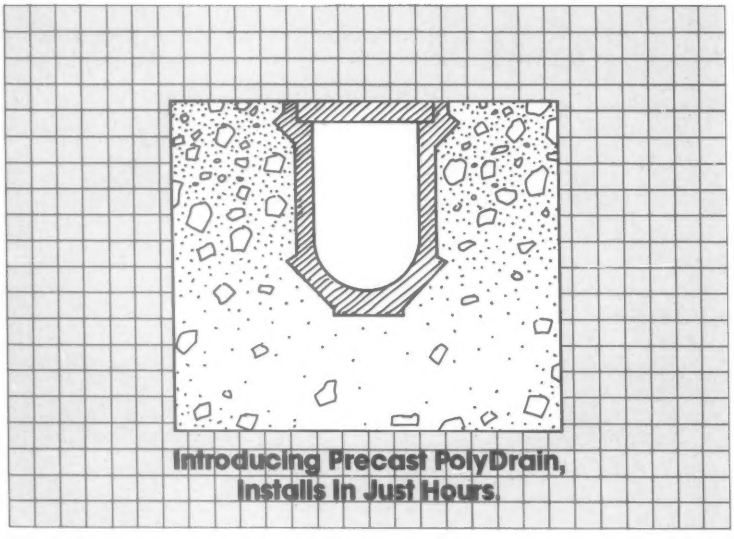
Pinking, removal from concrete, **86.821**

Pipe
cast-in-place
construction, **79.163**
performance, **79.163**
historic concrete sewer, **83.340**
history of development, **85.280**
machine casts in place, **78.674**

Placing. *See* Pumps; Conveyors; Placing methods

Placing booms, **79.379**
installation for high-rise, **82.635**
installation method, **86.573**
maintenance recommendations, **80.392**
save money on 5-story job, **86.573**
truck mounted or separate, European practice, **78.97**

Maybe It's Time You Ditched Cast-In-Place Trench Drains



Cast-in-place trench drains are out-of-place in today's world.

They take too long to build and are never precise. Then there's the cracking, corrosion and ponding.

Precast PolyDrain typically installs in just hours—a big time savings!

And once you're finished, you know you've done a good job. PolyDrain is made of a high strength polymer concrete (17,000 psi) that resists corrosion and freeze/thaw attack. And due to PolyDrain's unique hydraulic design, fluids are discharged at a high velocity along a built-in 0.6% slope, preventing ponding, settlement of solids and resultant problems.

To find out more, call your PolyDrain Distributor or our headquarters at 800/438-6057. (800/334-6057 in NC).

POLYDRAIN

ABT, Inc., Box 837, Troutman, NC 28166, 800/438-6057 (800/334-6057 in NC), Telex 703567

circle 164 on reader service card

Placing methods
alternatives reviewed, **85.847**
cause blemishes in formed surfaces, **79.719**
continuous for high walls, **79.29**
conveyor
crane mounted, **86.327**
self-propelled, **86.327**
crane and bucket, high-rise, **82.723**
effect on air content, **84.717**
effect on form pressure, **85.516**
effect on formwork, **79.537**
hoppers built into forms, **82.349**
hot weather precautions, **83.381**
tremie for concrete under water, **86.123**
Plastered walls, expansion joints, **80.484**
Plastering, repair techniques with, **77.153**
Plastic film
repairs pool leaks, **84.901**
waterproofing below-grade walls, **86.384**
Plastic form liners. *See* Form liners, plastic
Plastic shrinkage cracking
causes and cures, **79.247, 85.855**
description and causes, **86.604**
repair outdoors?, **86.488**
Play equipment, made of concrete, **77.331**
Plywood
care and handling for maximum reuse, **85.237**
product standards, **84.445**
types available for formwork, **85.237**
Poles, prestressed, design and manufacture, **85.245**
Police Memorial Building, architectural concrete, **82.587**
Polyester coatings, properties and uses, **81.406**
Polyester resins, fast setting repairs, **79.177**
Polyethylene. *See* Plastic film
Polymer concretes
ACI reference volume, **86.511**
bridge deck overlays, construction, **84.711**
corrosion resisting overlay, **84.503**
definitions and data sources, **82.742**
high strength overlays, **79.13**
types used for bridge deck overlays, **84.711**
Polymer impregnation
bridge deck protection, **79.272**
crack repair, **85.37**
repairs porous concrete, **79.13**
vacuum aids repair, **79.315**
Polymer modified concrete. *See* Latex modified concrete
Polypropylene fibers
crack control effectiveness, **86.371**
effect on fresh concrete, **86.363**
effect on hardened concrete, **86.363**
effectiveness as reinforcement, **86.749**
reinforce slab on grade, **85.446**
reinforcement, effect on concrete, **83.468**
reinforcement properties, **81.261**
Polystyrene, forms for lettering in concrete, **85.257**
Polystyrene bead concrete
insulating value, **83.543**
properties and production, **78.411**
properties and uses, **81.253**
Polystyrene insulation
base shell for shotcreted house, **86.874**
forms for concrete house walls, **85.580**
types compared, **81.62**
Polyurethane. *See* Urethane
Popouts
caused by lightning, **77.117**
caused by pyrites, **77.151**
caused by shale particles, **85.710, 86.164**
causes and cures, **77.454**
prevention and repair, **83.58**
repair, **79.139**
shale, prevention, **85.879**
Porous concrete. *See also* No-fines
no-fines mix, **80.620**
repaired by polymer impregnation, **79.13**
Portland Cement Association
educational programs, **82.849**
training programs offered, **77.555**
Portland cement paints, properties and uses, **81.406**

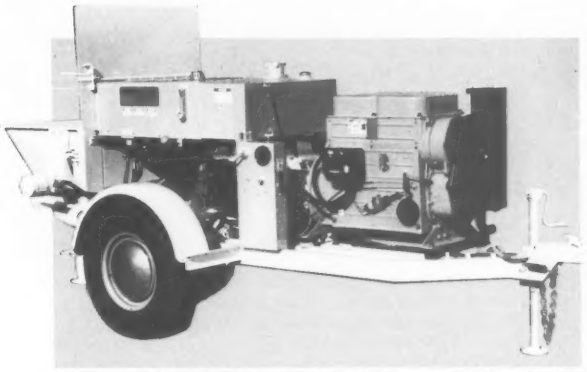
(more)

Mayco LST Series of Mid-Range Concrete Pumps

QUALITY AND RELIABILITY
DON'T HAVE TO COST MORE

SENSIBLY PRICED—LST 60S

- A long-stroke concrete pump designed to place concrete mixes containing 1½" aggregate
- Volume outputs ranging from 0 up to 60+ cubic yards per hour
- Versatile—pumps ½" minus pea gravel mixes
- Only two wearing parts in concrete valve—a wear ring and wear plate
- Long hose jobs . . . tougher mixes . . . higher volume that a larger hydraulic pump offers with pressure capabilities in excess of 900 psi



Featuring **MAYCO's** exclusive **Balanced Hydraulics™**

In addition to placing concrete for slabs and decks, this versatile pump handles many applications including shotcreting, masonry block fill, sand backfill, chemical and organic slurries, oil field drilling cuttings and compaction grouting.

OTHER MAYCO PUMPS:
C30-HD small line concrete pump
LST 30/60 high volume pea gravel pump
PF series of plaster and fireproofing pumps

Ask about our program for starting a concrete pumping service. A profitable way to diversify. Write or call today for the name of your local Mayco pump distributor.

MAYCO PUMP CORP.
4640 Sperry St., Los Angeles, CA 90039 • (818) 507-3900

circle 150 on reader service card

THE DYWIDAG EXTRUDED COUPLER SPLICE. THE FAST, STRONG, COST-EFFECTIVE WAY TO JOIN REBARS.

Now you can splice any type of deformed reinforcing bar, including epoxy coated, at a rate of 20 to 30 splices per hour. Splices that exceed the load capacity of the rebar and don't require special splicing skills. The results are consistent, cost-effective, slip-free splices capable of withstanding both static and dynamic loads.

CUTAWAY VIEW OF FINISHED SPLICE

Handling rebar sizes from #5 through #18, this simple, reliable splicing system uses a compact hydraulic press to cold extrude a coupler over the butted ends of reinforcing steel in one operation. There's no need for special bar end preparation. And extruded transition splices are available.

Send for literature or ask to see our video tape presentation on this proven splicing system. Dywidag Systems International, P.O. Box 9, 107 Beaver Brook Road, Lincoln Park, NJ 07035-0009. (201) 628-8700.

DSI
DYWIDAG Systems International

circle 124 on reader service card

Portman, John
Peachtree Center Hotel, **83.97**
Renaissance Center Hotel, **83.99**

Post-tensioned box girders, precast in forming machines, **84.405**

Post-tensioned buildings, details and shop drawings, **83.327**

Post-tensioned floors
simplify hotel's structural frame, **85.251**
superflat construction, crack-free, **83.396**

Post-tensioned roof, waterproof, **83.342**

Post-tensioned slab, fire damage evaluated, **79.612**

Post-tensioning
aided by shrinkage compensating concrete, **83.331**
definitions of common systems, **83.323**
earth-sheltered construction, **81.105**
Eisenhower Station, Washington Metro, **84.125**
growth and development, **80.125**
hardware systems described, **83.323**
industry status report, **83.313**
inspection guidelines, **83.317**
parking deck construction, **83.344**
precast bridge deck slab, **86.36**
runway overlay at O'Hare, **82.261**
segmental box girder bridges, **81.135**
shrinkage compensated slab, **79.117**
slab on grade design, **83.313**
slipformed cement silo, **82.45**
tilt-up multistory panels, **80.527**

Post-tensioning tendons
corrosion protection, **86.233**
grouting practices, **84.47**
inside segmental girder box, **86.935**

Power screeds, floor construction, **79.369**

Power trowels, features explained, **82.717**

Pozzolans. *See* Fly ash; Silica fume; and others

Precast concrete. *See also* Precast panels; Tilt-up
barrier wall systems, **83.767**
bridge constructed with arch segments, **85.659**
columns, demountable building assembly, **85.523**
combined with slipforming, **80.331**
composite with cast-in-place, floor system, **86.574**
contractor makes his own, **80.791**
contractor organizes to produce, **80.331**
expanding market noted, **84.1122**
failures caused by end restraint, **81.641**
fireplace, **80.839**
Forest City Dillon modules for high-rise, **84.131**
fountain at Chicago Botanical Garden, **86.35**
lift slab method, **86.115**
lightweight structural applications, **85.497**
manufacturing methods, **80.791**
masonry walls, retaining/noise-abatement, **81.905**
modules for Orlando hotel, **86.674**
noise barriers at Heathrow, **86.396**
on-site work advantages, high-rise buildings, **80.331**
panels make helicopter pad, **77.282**
permanent forms for slabs, **82.355**
prison cells, **86.947**
railroad underpass, jacked into place, **84.306**
Saudi Arabian developments, **80.797**
sculpture, *Articulated Wall* in Denver, **86.337**
spandrels stay in place as forms, **84.949**
stairs for high-rise, **84.970**
surge barrier in Netherlands, **83.661**

Precast panels. *See also* Precast concrete; Tilt-up
architectural to match limestone, **85.868**
basement walls carry own footings, **86.877**
bridge deck, no overlay, **86.36**
cellular for home construction, **85.584**
connection inserts homemade, **85.86**
demountable building assembly, **85.523**
exposed aggregate, twelve-sided house, **85.581**
facing for reinforced earth structure, **84.653**
floating dock at Valdez, **83.131**
hollow core slab over house basement, **86.881**
insulated for home construction, **85.603**
insulated for home walls, **85.601**
make earth-sheltered home, **82.507**
match Biltmore Hotel masonry, **79.307, 79.309**
prison construction with, **86.145**
repair bridge deck, **84.147**
rock faced for retaining wall, **85.937**
slab connections installed in field, **85.210**
slab forms for composite construction, **85.437**
structural lightweight, steel framed, **80.804**
wall screens radio wave interference, **84.741**

Precast prestressed concrete. *See also* specific product
bridge sections outlined, **85.649**
railroad ties, **83.822**

Preplaced aggregate concrete, use for repairs, **81.31**

Pre-pour conferences, contractor and ready mix supplier, **85.265**

Preshoring, speeds high rise construction cycle, **86.307**

Presoaking, lightweight aggregate, **85.505**

Pressure, concrete on forms, English formula revised, **86.593**

Prestressed concrete. *See also* Post-tensioning
advantages and applications, **81.235**
behavior explained, **81.235**
certified producers listed, **83.962**
chloride limits studied, **85.393**
demolition methods, **86.405**
double tees make two-level home, **85.585**
history of development, **80.125**
sculpture, design/construction, **84.313**

Prestressed panels, insulated for apartment building, **85.596**

Prestressed poles, design, fabrication, and erection, **85.245**

Prison cells
custom forms for, **82.349**
self-stripping forms for, **86.947**

Prison construction, precast panel buildings, **86.145**

Prison labor, paving operation at Kansas penitentiary, **85.527**

Proctor test, soil density, **85.681**

Profilograph, floor flatness measurement, **84.291**

Profilometer, measures pavement smoothness, **86.439**

Promotion. *See* Business organization

Proportioning. *See* Mix design

Pullout testing
advantages/disadvantages, **81.577**
correlation with cylinders, **82.376**
equipment and procedures, **81.577**
maturity meter aids timing, **83.627**

Pulse echo tests, locate internal flaws in concrete, **86.129**

Pulse velocity testing. *See also* Pulse-echo tests
methods and significance, **81.571**

Pump booms. *See* Placing booms

Pump lines
cleanout for high-rise work, **85.925**
European state-of-the-art, **78.97**
lightweight aggregate concrete, **85.505**
plugging problems, **85.370**
safety precautions, **84.1001**
system for bottom-up work, **86.533**
system for wall placement, **79.379**

Pumpable concrete, mix design for bottom-up work, **86.533**

Pumping
boom maintenance practices, **80.392**
columns from bottom, **82.182**
distance record, **81.612**
equipment selection, **82.629**
European developments, **78.97**
Frankfurt tower record, **78.170**
hand signals for pump/boom, **78.768**
lightweight structural concrete, **85.505**
line pressure, **82.629**
lines/booms deliver concrete, **79.379**
planning and scheduling, **85.177**
precautions to maintain continuity, **86.533**
record setting jobs, **80.533**
residential walls, **79.19**
separate placing boom for low-rise job, **86.573**
separate placing booms on high-rise jobs, **82.635**
Texas Commerce Tower record, **82.59**
walls 50 feet high, **79.29**
walls from bottom, **86.533**

Pumping contractors, need to know mix design, **82.721**

Pumps
European state of the art, **78.97**
trailer mounted, when to use, **85.177**
truck mounted with boom, when and where to use, **85.177**

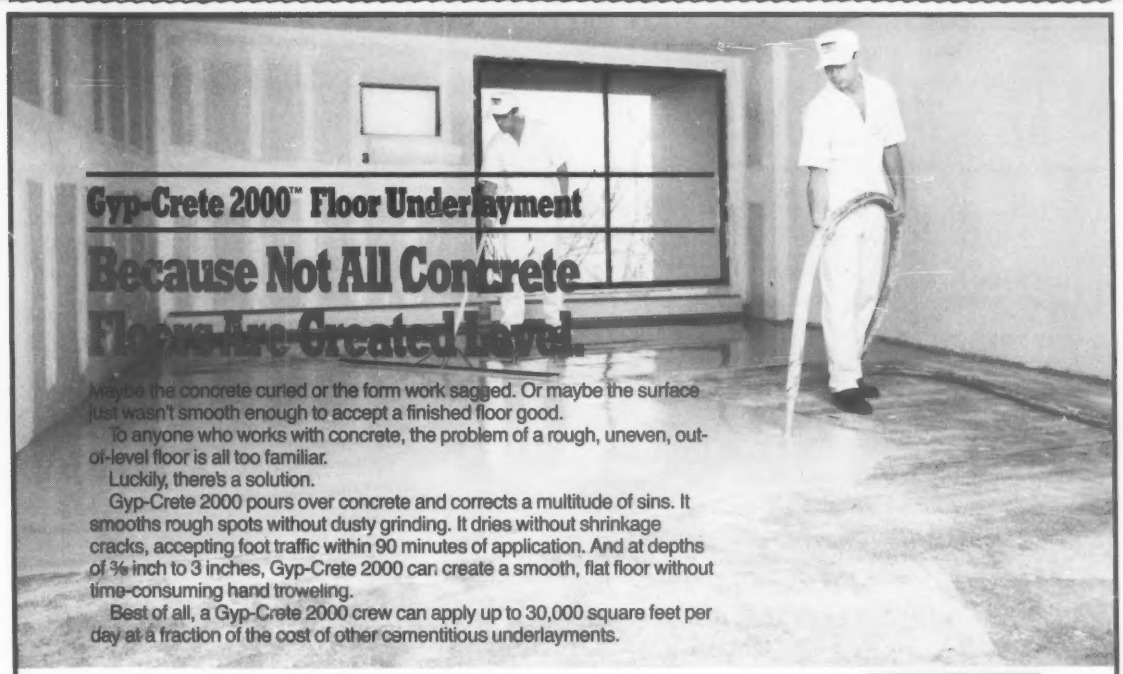
Pyrite, causes popouts, **77.151**

Q

Quality assurance
British warranty program, **77.383**
CQM system for fresh concrete, **84.317**
European systems for, **77.383**
responsibility for and benefits of, **83.813**
shotcrete, **84.633**

Quality control
achieving with economy, **77.99**
choosing the right test lab, **81.591**
construction tolerances, **80.743**
facilitated by pre-pour conference, **85.265**
high strength concrete, **81.241**
home builder's checklist, **84.342**
how to handle low cylinder breaks, **81.563**
how to meet tolerances, **79.659**
pavements, Milwaukee experience, **85.431**

(more)


Gyp-Crete 2000™ Floor Underlayment
Because Not All Concrete
Floors Are Created Level.
Maybe the concrete curled or the form work sagged. Or maybe the surface just wasn't smooth enough to accept a finished floor good.
To anyone who works with concrete, the problem of a rough, uneven, out-of-level floor is all too familiar.
Luckily, there's a solution.
Gyp-Crete 2000 pours over concrete and corrects a multitude of sins. It smooths rough spots without dusty grinding. It dries without shrinkage cracks, accepting foot traffic within 90 minutes of application. And at depths of ⅜ inch to 3 inches, Gyp-Crete 2000 can create a smooth, flat floor without time-consuming hand troweling.
Best of all, a Gyp-Crete 2000 crew can apply up to 30,000 square feet per day at a fraction of the cost of other cementitious underlayments.
For more information, contact:
Gyp-Crete Corporation
920 Hamel Road, Hamel, MN 55340
(612) 478-6072
GYP-CRETE
FLOOR UNDERLAYMENT
2000
circle 138 on reader service card

Quality control . . . continued
ready mixed concrete
benefits producer, **83.818**
case histories, **83.818**
responsibility for and benefits of, **83.813**
small test cylinders, **79.751**
specifying both slump and mortar content, **86.139**
strength evaluation method, **79.471**
superflat floor, **84.291**
tests of fresh concrete, **81.557**
unit weight test advocated, **86.607**
unit weight test questioned, **86.748**

R

Racetrack buildings, concrete for fire resistance, **86.633**

Radiant heating systems. *See also* Snow melting
embedded in residential slabs, **86.561**
in air-entrained slab, **83.629**

Radiation shielding. *See* High density concrete

Railroad ties (concrete)
Canadian uses reported, **78.292**
design and installation, **83.822**
production of, **83.822**

Railroad track
base slab of concrete, **84.309**
continuously reinforced slab base, **81.212**

Rain
damage to fresh slabs, repairing, **86.570**
protecting fresh concrete from, **83.355**

Rainwater runoff stains, removal from concrete, **86.821**

Rankin, Lou
animal sculptor, **78.31**
sculpture techniques, **84.1093**

Rapid analysis machine (RAM), how it works on fresh concrete, **79.121**

Rapid set. *See* Fast set

Ready mix supplier
helps prevent scaling, **78.457**
laboratory accreditation for, **81.601**
must know specifications, **85.263**
promotes his own market, **85.61**
use of pre-pour conference, **85.263**
uses mobile batcher mixers, **84.5**

Ready mix trucks
front discharge, **84.15**
splitter breaks hardened mix, **82.208**
with conveyor for discharge, **84.19**

Ready mixed concrete
certified plants listed, **83.952**
challenging jobs reported, **85.61**
disposal of returned product, **86.299**
handling and placing methods, **85.847**
overrun and underrun problems, **86.236**
performance specifications, **79.471**
pre-pour conference solves problems, **85.265**
promotion, whose responsibility?, **85.679**
quality control, benefits producer, **83.818**
recycling returned mix into new product, **86.299**
salvaging from disabled truck, **82.604**
specification and ordering details, **85.841**
superplasticizer effects on, **85.337**

Rebound hammer
early strength tests, **80.421**
test procedures, **81.571**

Reclaimed ready mix. *See* Recycled concrete

Record setters
bridges, **80.44, 80.47, 80.129, 80.157, 80.248, 83.115**
buildings, **80.9, 80.16, 80.33, 80.131, 83.89, 83.91, 86.859**
coal silo, **77.193**
concrete pours, **80.29, 80.175, 80.367, 81.606, 83.170, 83.703**
dams, spillways, **80.31, 80.39**
domes, roofs, **80.16, 80.18**
double tees in lightweight concrete, **85.497**
high strength concrete, **80.31**
home building speed, **82.203**
Metropolitan Tower, New York, **86.859**
pumping, **80.29, 80.533**

SETTING THE STANDARD

Puckett Bros.' 510D Grader and SF820D Concrete Curber were designed to meet the needs of the small to medium contractor and developer.

Using Puckett Bros.' economical 510D Site Prep Machine the contractor can eliminate the need for multiple pieces of equipment on the job site. The versatile grader features a front-end loader, rear-mount scarifier, 10-foot moldboard and optional high efficiency Vibratory Plate Compactor. Accurate grade and slope can be established when used with optional stringline sensors or laser control system.

Easy to transport and use, the SF820D Concrete Curber boasts a newly designed state-of-the-art control panel and encoder stringline sensing system; stainless steel hopper and tanks; on-board washdown system, and self-adjusting track. Designed for maneuverability and performance, this curber can slipform a tight radius, pour below grade and lift 22" vertically to clear obstacles. The powerful, all-wheel drive SF820D Concrete Curber is setting the standard in the market today!

Call 1-800-PUCKETT For More Information

PUCKETT BROS. MFG. CO., INC.

3870 Highway 124, Lithonia, Georgia, USA 30058 • (404) 972-1732

circle 166 on reader service card

pumping at Texas Commerce Tower, **82.59**
pumping distance, **81.612**
towers, CN, **83.125**
Water Tower Place, **81.247**

Recreational courts, tennis, construction practices, **86.469**

Recreational uses. *See also* specific topics
play and sports equipment, **77.331**

Recycled concrete
cost data, **80.725**
crushing operation, **80.418**
funding by FHWA, **80.730**
pavements
crushed and in-place, **82.62**
uses, **86.439**
pavements used as aggregate, **85.413**
plant operation, **80.733**
returned ready mix, **86.299**
used as aggregate, **80.725**

Recycling. *See* Recycled concrete; Renovation

Refractory brick, contaminates aggregate, **81.259**

Refractory concrete, calcium aluminate cement, **82.437**

Refractory shotcrete, 80.189

Reinforcement. *See also* Fiber reinforcement; Reinforcing steel
carbon fiber used in Japan, **86.49**
congestion eased by creative detailing, **83.669**
kevlar fiber properties, **81.261**
locating in hardened concrete, **77.158**
nonmagnetic materials, **78.311**
costs, **78.544**
polypropylene fibers, **86.263, 86.371**
tie wires and tying, **84.499**

Reinforcing steel. *See also* Detailing
architectural concrete, problems, **78.590**
bar supports, estimating practices, **81.793**
bars
epoxy coated, **80.587, 83.826, 84.809**
estimating, **81.793**
field bending, **83.244, 86.552**
grout filled splices, **85.720**
mechanical splices, **83.389, 85.23**
placement planning, **83.675**
placing standards, **84.155**
pricing practices, **81.793**
rebending, **86.837, 86.970**
specifications for, **81.819**
splice sleeve with grout, **85.929**
welded splices, **81.807**
cathodic protection, **84.561**
connection boxes or strips, **86.552, 86.836**
cover maintained by side form spacers, **81.825**
cover required in grade beams, **85.543**
detailing practices, **81.815**
doweled connections, boxes or strips, **86.552**
galvanized, performance, **77.496**
helicopter delivery, **81.432**
injuries associated with handling, **84.732**
mechanical splice at bulkhead, **84.452**
placement in slabs on grade, **86.29**
placing in slipform, **78.262**
positioning in slab on grade, **85.847**
residential construction needs, **86.29**
shrinkage compensated floor, **79.110**
specifying epoxy coated, **84.809**
stainless, properties and specifications, **86.46**
tolerances for setting, **84.155**
welded wire fabric
bending of sheets, **81.803**
bent for stirrups, **84.591**
detailing manual, **84.43**
high strength, **80.535**
ties and stirrups, **83.669**
types and sizes, **81.803**

Release agents
effect on later paints and coatings, **77.481**
how to choose proper one, **84.417**
questions/answers, **79.527**
sprayer for application, **85.943**
types available, **84.417**

Renaissance Center Hotel, design, **83.99**

Rendering. *See* Plastering

Renovation
bridge deck with precast panels, **84.147**

(more)

TAKE THE BITE OUT OF RUST!

This winter, while your steel forms, tools and equipment are lounging in storage, guess what brown menace is going to be chewing them to bits?

Yep! Rust.
And its buddy, Corrosion.

But you can stop rust cold. In fact, you can bite back . . . with Store-Cote RP-6 Rust Preventative.

Store-Cote RP-6 Rust Preventative:

- Effectively protects steel against rust and corrosion up to 8 months.
- Applys just like your release agent.
- Does NOT form a waxy coating that has to be scraped off.
- Does NOT have to be removed to re-use forms and equipment.
- Will NOT harden or gel in its container after opening.

Come spring you won't have to worry about costly damage to equipment, stained concrete, expensive delay and labor costs to get equipment and forms in shape. They'll be in shape–ready for use!

Take the bite out of rust! Call Cresset toll-free for complete details and the name of your distributor.

But hurry! Winter's almost here. And so is you-know-who.

Cresset

CRESSET CHEMICAL COMPANY
Release Agents • Coatings • Hand Cleaners
Main Street • Box 367 • Weston, Ohio 43569
Phone TOLL-FREE (800) 367-2020
In Ohio—(419) 669-2041 Collect
© 1984, Cresset Chemical Company

circle 121 on reader service card

Renovation . . . continued
bridge girders, post-reinforcement, **84.705**
bridge rehabilitation programs, **83.598**
glass-fiber-reinforced concrete, hotel facade, **82.664**
old buildings, overall planning, **81.373**
references listed, **81.427**
Saint Katharine Docks, become multi-use facility, **81.395**
silos converted to condominiums, **83.5**
silos converted to hotel, **81.385**

Repair. *See also* specific topics
acrylic concrete uses, **84.881**
architectural concrete, **86.623**
block basements with reinforced concrete, **83.141**
bridge decks, Iowa method, **78.323**
classified reference list, **77.166**
corrosion damage, vertical concrete surfaces, **81.97**
cracks, methods summarized, **85.37**
curing requirements, **86.623**
defects in formed surfaces, **80.215**
epoxy materials, properties and specs, **84.873**
epoxy materials and methods, **79.169**
failure in thicker epoxies, **80.735**
fast-setting materials for pavements, **79.177**
general principles, **83.21**
high temperature, magnesium phosphate cement, **79.412**
how to make it last, **81.19**
index of data in special issue, **77.175**
leaking joints, urethane foam, **84.594**
materials and methods
architectural concrete, **86.623**
overview, **80.41, 81.21**
selection guide, **81.31, 84.865**
minimized by good construction and maintenance, **81.7**
oil tanker bow, ready mixed concrete, **80.260**
pavements
partial depth, **83.13**
techniques listed, **86.439**
polymer and polymer-impregnated concrete, **79.13**
polymer impregnation under vacuum, **79.315**
properties of material used, **84.865**
questions and answers, special issue, **77.123**
references listed, **81.427**
robot waterblaster prepares surface, **85.785**
roof slab alternative, **86.486**
selecting correct materials, **83.21**
settled slabs, with slabjacking, **81.147**
shear cracks in girders, post-reinforcement, **84.705**
shoring for bridge during, **84.744**
shotcrete for buildings, **81.379**
shotcrete in cold weather, **79.414**
shrink resistant grouts for, **84.893**
shrink resistant mortar for, **84.893**
surface preparation equipment, **86.927**
surface preparation for, **81.21, 81.391, 83.21**
texture match in architectural concrete, **86.623**
using latex modified concrete, **84.889**

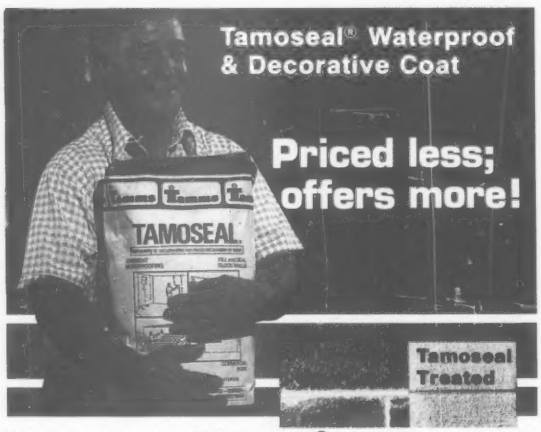
Repair contractor, case studies of jobs, **83.36**

Research, British Cement and Concrete Association, **79.463**

Reservoirs. *See* Water tanks

Reshoring. *See also* Shoring
how to specify, **80.199**
preshoring technique speeds cycle, **86.307**
test cell measures loads, **77.83**

Residential construction. *See also* Houses; Driveways; Sidewalks
ACI 332 guide, **83.757, 86.226**
advantages of concrete for, **85.577**
apartments, prestressed insulated panels, **85.596**
basement walls precast, with integral footings, **86.877**
basements and foundations, special issue, **78.193**



Delivers more user advantages: easy-to-use and prepare . . . mixes fast with water and spreads like butter; strong and durable . . . cement-based protection; lower in cost . . . for small budgets!

Tammsway Masonry Coatings System:

Corporate: 1222 Ardmore Ave., Itasca, IL 60143, 312-773-2350, Telex: 910 651 2165
Western: 9920 Flora Vista Ave., Bellflower, CA 90706, 213-925-5506
Intn'l Dir. of Sales: Paul von Wymetal, dzt. PO Box 262-A1011, Vienna, Austria

Tamoseal Sand (gray, oyster gray, white) waterproofs, fills and seals. Tamoseal Smooth (white and blue) adds protection and finishes—formulated for swimming pools. Matched custom colors available.

Ask for FREE Tamoseal Technical Guide!

Specify Tammsway . . .
The System that works together to protect, beautify & build profits!

Tamms

circle 183 on reader service card

Application is fast and easy! You save time and labor costs!

Finisher levels, seals and textures raw concrete and masonry to eliminate the need for rubbing. Also, adds strength and waterproofs.

Not just a coating! Cement-based Finisher becomes an integral part of the cement/masonry surface. Mix with water and Tamms Akkro 7-T.

Available in gray, oyster gray, white or matched custom colors.

Ask for FREE Finisher Technical Guide!

Tammsway Masonry Coatings System:

Corporate: 1222 Ardmore Ave., Itasca, IL 60143, 312-773-2350, Telex: 910 651 2165
Western: 9920 Flora Vista Ave., Bellflower, CA 90706, 213-925-5506
Intn'l Dir. of Sales: Paul von Wymetal, dzt. PO Box 262-A1011, Vienna, Austria

Spécify Tammsway . . .
The System that works together to protect, beautify & build profits!

Tamms

circle 184 on reader service card

British warranty program, **77.383**
cast-in-place cabin built by owners, **85.675**
concrete builders and systems listed, **85.613**
Cortina lift slab system, **81.717**
duplex homes, all concrete, **77.272**
earth-sheltered, **82.73**
dome roofs, **80.684**
ecology house, **78.90**
questions/answers, **78.120**
energy conservation, shotcrete over polystyrene, **85.592**
fiber-reinforced shotcrete, **77.115**
fire safety improved with concrete, **79.591**
flatwork requirements, **85.771**
floor above basement, forming methods, **85.603**
floor as thermal mass, **82.841**
formwork for walls, **85.915**
foundation settlement and heaving, **81.659**
good practices outlined, **85.697**
high-rise condominiums, Metropolitan Tower, New York, **86.859**
historic gravel wall house, 1852, **85.571**
history, 1918 houses, **82.218**
hollow core precast floor over basement, **86.881**
how concrete meets housing needs, **85.565**
Japanese home has round windows, **83.135**
joint details for flatwork and walls, **86.561**
Lawson home in Utah, CRSI award winner, **86.887**
lift slab-plus-walls, **77.90, 81.717, 85.603**
log cabin simulated in concrete, **86.1162**
no-fines concrete walls, **79.123**
post-tensioning earth-sheltered houses, **81.105**
precast panels, earth-sheltered, **82.507**
precast retaining wall is part of house, **80.688**
precast with cast-in-place, Forest City Dillon, **84.131**
prestressed double tees make home, **85.585**
Puerto Rico uses concrete, **86.902**
pumped walls, **79.19**
ready made forms for round house, **85.589**
reinforcing steel needs, **86.29**
rib floor system over basement, **83.747**
roof tile warranted 50 years, **86.885**
series of articles announced, **85.697**
shotcrete on polystyrene shell, **86.874**
shotcrete on wire/urethane panels, **80.148**
shotcreted dome inside urethane layer, **85.724**
single-family houses in Iowa, **83.737**
small textured panels, urethane foam poured between, **85.676**
soil properties explained, **82.485**
townhouses cast in place economically, **85.597**
tunnel form system for, **85.603**
vacuum dewatered tilt-up, **82.201**
waterfront home in British Columbia, **81.682**

Restoration
historic structures, **85.290**
pavements, with CPR system, **83.13, 86.439**
precast panels match limestone, **85.868**

Retail store for concrete, **82.206**

Retaining walls
construction details, **84.977**
earth-sheltered construction, **80.659**
gravity design, **84.977, 85.212**
precast panels tied back in earth, **77.270, 80.688, 84.653**
precast units stacked and planted, **83.767**
rock faced precast panels for, **85.937**

Retarders. *See also* Admixtures
lead and zinc in aggregate, **77.237**

Reunion Tower, Dallas, slipform construction, **77.620**

Revetment, concreted with fabric forms, **80.395**

Revibration
effect on form pressures, **78.67**
improves concrete quality, **77.537**
recommended for architectural concrete, **79.6**

(more)

PUT YOUR MATERIALS WHERE AND WHEN THEY'RE NEEDED, HYDRAULICALLY!

Maneuverable and mobile as mountain goats, the Morrison's Power Buggies provide economical alternatives to the transportation of all kinds of materials in and around the job site, or plant location. Make Morrison's Power Buggies part of your equipment fleet.

The **PB-14W Walk-Behind Power Buggy** has a full 14 + cubic foot payload. The top speed is a brisk 3.5 mph walking pace and the PB-14W is simple to operate. Its hydraulic power system is dependable and virtually maintenance-free—no gears, belts, chains or transmissions to wear out. The PB-14W has a variable reverse speed adjustment which enables the operator to precisely control backing speed—very handy in tight spots or with liquid loads.

The **PB-16R Rider** helps you deliver even bigger payloads with its big (16 cu. ft.) capacity. The hydraulic system is powered by an 11 hp engine. Again, there are no belts, gears or transmissions to wear out, making the PB-16R a reliable and dependable addition to your equipment fleet. The single-wheel option makes the buggy just 34½ inches wide to fit through most doorways.

DELIVER ¾ YARD WITH THE PB-21R!

The **PB-21R Rider**, with a whopping 21 cu. ft. capacity, really delivers the goods—and a lot of them! Its size permits far more mobility and versatility than its nearest competitor.
The reliable hydraulic system, with an 18 hp Briggs & Stratton engine, (electric start is standard) assures dependable operation in the most rugged conditions.

AND NOW MORRISON'S INTRODUCES ONE OF THE MOST VERSATILE MATERIAL HANDLERS EVER!

Morrison's PB-16RF Flat-Bed Rider is the answer for on-site transportation of heavy materials. The new flat bed is available as an option and may be replaced with the bucket as needed, in minutes. How's that for versatility?
Available on the PB-14W, PB-16R and PB-21R buggies.

MODEL PB-16R RIDER

MORRISON'S®

MORRISON'S CONCRETE & EQUIPMENT, INC.
INNOVATORS IN THE CONCRETE EQUIPMENT INDUSTRY
9827 MOUNT HOLLY ROAD, CHARLOTTE, NC 28214-9605

Toll-Free 800-438-2923 (In NC, 800-821-2484)

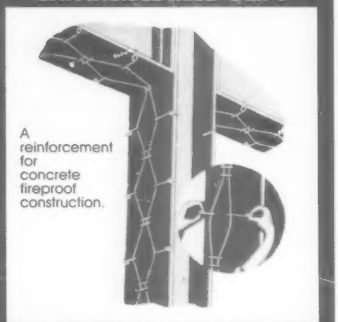
MORRISON'S CONCRETE & EQUIPMENT, INC. IS COVERED BY ONE OR MORE OF THE FOLLOWING U. S. PATENTS AND / OR OTHER PATENTS PENDING. 4030873,4349295,4253778,4388017,4461341

circle 158 on reader service card

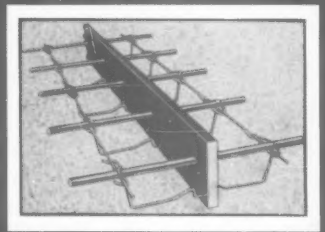
EQUIPMENT DISTRIBUTING CORPORATION

Hico/Conver is the trade name only.

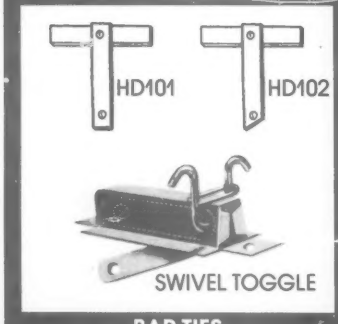
EXPANSIBLE REED CLIPS



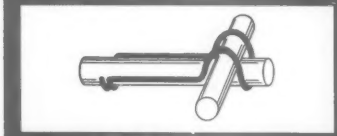
ROAD DOWEL SUPPORTS



CEILING HANGERS



BAR TIES



FLAT BAR TIES

EQUIPMENT DISTRIBUTING CORPORATION

201-641-8414

3 Eucker Street
Ridgefield Park, New Jersey 07660

circle 129 on reader service card

Rice hull cement, makes concrete resist acid, **77.54**

Ring beam, slipformed for silo, **82.64**

Riser formwork, Hubert Humphrey Metrodome, **83.679**

Risk management, 86.225

Road of Friendship, concrete sculpture in Mexico, **78.149**

Robot floor finisher, Japanese design, **85.887**

Robot waterblaster, prepares bridge deck for resurfacing, **85.785**

Rock faced panels, tilt-up construction, **78.145**

Rock formations, simulated in concrete, **82.656**

Rollcrete. *See* Roller compacted concrete

Roller compacted concrete
- dam construction, **82.709**
- definition and properties, **82.709**
- pavements
  - installation practices, **86.287**
  - mix proportions for, **86.287**
  - performance record, **86.287**
- paves parking area, **85.304**

Roller-skating rink, subfloor construction, **77.489**

Roman cement and concrete, 81.1024

Roof decks, lightweight insulating concrete, **78.230**

Roof systems, shotcrete over polystyrene panels, **86.874**

Roof tile
- cabin in Oregon, **85.675**
- colored concrete, **82.374**
  - installation, **83.750**
  - life-cycle costs, **83.750**
  - warranted for 50 years, **86.885**

Roofs
- failure causes, **80.133**
- forming system selection, **86.5**
- insulated with perlite concrete, **83.559**
- lightweight insulating concrete, **78.411**
- post-tensioned for water resistance, **83.342**
- repair alternatives, **86.486**
- shotcrete over insulation, **78.279**

Rope, properties and usage, **85.1074**

Rust stain, removal from concrete, **86.736**

Rustication strips, formwork, **79.519**

S

Sack rubbing, concrete finish, when and how, **78.608**

Saddledome (Calgary) stadium, lightweight structural concrete used, **85.497**

Safety. *See also* OSHA
- bull floats, nonconducting handles, **86.571**
- causes of design/construction failures, **82.345**
- cement burn prevention, **82.361**
- cement burn warning statements, **85.74**
- composite construction, stability problems, **84.815**
- construction zone management, **85.110**
- contractor's formwork checklist, **81.111**
- during shotcreting, **78.27**
- enhanced by field supervision, **82.739**
- fire code requirements, **79.597**
- formwork, codes and standards for, **85.271**
- median barrier rental, **80.244**
- median barriers effective, **79.72**
- movies available, **82.353**
- new OSHA rules for concrete, **85.944**
- precautions in handling reinforcement, **84.732**
- precautions in stain removal, **86.905**
- precautions with cleaning chemicals, **86.961**
- pump line cleanout, **85.925**
- pumping systems, **84.1001**
- record keeping helps prevent accidents, **78.39**
- shoring
  - double-deck, **86.713**
  - slide set, **82.369**
- stability of composite construction, **85.276**
- stain removal techniques, **86.539**
- training program for workers, **82.333**
- trench excavation, **86.556**
- undertow at dam corrected, **86.721**

Saint Peter's Basilica, construction history, **86.455**

Salt scaling. *See* Scaling

Salts, effect on hardened concrete, **81.25**

San Francisco Social Service Building, architectural concrete, **79.404**

Sand casting, ornamented tilt-up panels, **78.96**

Sand streaking, architectural concrete, prevention, **79.323**

Sandblasting
- architectural surfaces, questions/answers, **78.597**
- avoiding color loss, **84.667**
- effect on steel cover, **86.482**
- equipment and procedures, **86.927**

Saudi Arabia
- modernizes concreting work, **80.797**
- uses precasting and ready mix, **80.797**

Sawing
- blade types described, **85.753**
- bridge expansion joints 54 inches deep, **85.743**
- case histories, **82.81, 85.741**
- expansion joints 20 inches deep, **81.696**
- floor and wall openings, historic winery, **80.246**
- joints in paving slab, **82.243**
- keeping cut aligned, **84.676**
- openings in renovated silos, **83.5**
- openings in silo walls, **81.385**
- recommended blade speeds, **80.702**
- tools and techniques, **81.49**
- underwater work, **85.747**

Scabblers, types and operation of, **86.927**

Scaffolding, Shoring and Forming Institute, expansion, **80.427**

Scaling
- caused by deicer salt, prevention, **81.9**
- causes and prevention, **78.529, 86.394**
- causes and remedies, **79.247, 80.139, 85.855**

driveways, prevention, **78.457**
field study of flatwork, **80.139**
prevention on city streets, Milwaukee, **85.431**

Scarifiers, types and operation of, **86.927**

Scheduling of construction
computerized systems, **83.605**
fast track for composite construction, **85.863**

Schmidt hammer. *See* Rebound hammer

Screed rails
precast for flat floor, **85.968**
precast stay in place, **84.483**

Screed supports, used over vapor barrier, **78.551**

Screeding
flatwork, recommendations, **79.225**
use of vibrating backpack type, **85.933**

Screeds. *See also* Power screeds
leveling beam vibrates, **82.738**
vibratory backpack type, **85.933**

Screening. *See* Barrier walls

Screw classifier, reclaims returned ready mix, **86.299**

Sculpture
advantages of concrete for, **80.11**
animal figures by Rankin, **78.31**
architectural panels with Indian design, **83.411**
Black Hawk construction, **84.299**
elastomeric mold for, **79.537**
faceted glass with ferrocement, **82.193, 86.547**
ferrocement ballerina, **86.214**
Fountain of Time, exposed aggregate, **84.797**
gargoyles carved in concrete, **83.643**
gypsum cement, Elizabeth Burger, **86.734**
home fitted to rocky site, **81.682**
Metaphor in Utah desert, **86.747**
Neill, T.J.
makes dragon, **83.415**
animal and human figures, **86.218**
precast, *Articulated Wall* in Denver, **86.337**
precast prestressed, *Adventure in Concrete,* **84.313**
Rankin's method for animals, **84.1093**
reliefs by Ralph Prata, **83.349**
river god statue, England, **82.600**
Road of Friendship, Mexico, **78.149**
rose fountain precast, Chicago Botanical Garden, **86.35**
surface treatments, **77.313**
thin mortar laid up with glass fabric, **77.313**
whimsical British examples, **82.989, 83.484**

Sea shells. *See* Coquina

Sealers. *See also* Coatings
epoxy, **79.169**
floor slab application, **77.25**
types to resist rebar corrosion, **84.503**

Seattle aquarium, construction, **77.656**

Seawater
affects concrete durability, **81.532**
concrete resistance to, **78.548**
specal cement tested, **86.401**

Seawater in mix, process to improve durability, **86.401**

Security. *See* Theft prevention

Segmental precast girders, moved on air skid, **79.406**

Seismic considerations. *See* Earthquake resistance; Earthquakes

Seismic risk maps, U. S. zones, **86.29**

Self lifting forms, how they work, **82.173**

Self raising forms. *See* Self lifting forms

Self stripping forms, how they work, **86.947**

Selma, lightweight concrete construction, **85.519**

Services directory, classified, **77.695, 78.727**

Sewage treatment plants, formwork for, **77.615**

Sewers, historic concrete pipe, **83.40**

Shafts, lining with concrete, **84.668**

Shale, causes popouts, **86.164**

Shear cracks, repair in girders, post-reinforcement, **84.705**

(more)

Matcor CPBD™ Systems stop corrosion damage or we pay for the repairs

Matcor is the pioneer in developing Cathodic Protection Systems for concrete structures. We have protected millions of square feet of concrete around the world.

Once corrosion of the reinforcing steel starts only a Matcor CPBD™ System can stop it. Patching, sealers, membranes & overlays are only short term fixes for a corroding structure. Corrosion is an electrical process that only an electrical system can stop—Matcor CPBD™ Systems have been used for over 10 yrs. on:

- Bridges
- Parking Garages
- Buildings
- Marine Structures

Before you patch or repair concrete again, contact Matcor for all the facts about our Warranty program.

MATCOR, INC.

The Industry Leader in Corrosion Control
P.O. Box 687, Doylestown, PA 18901 U.S.A.
800-523-6692 (215) 348-2974
Worldwide

circle 149 on reader service card

Shear failures
caused by design/construction errors, **81.641**
condominium at Cocoa Beach, **82.90**
Shear wall, exterior, architectural, **82.571**
Shell construction, modular forming kit, shotcreted homes, **85.598**
Shell structures. *See also* Domes
specification provisions, **80.199**
Shellac, removal from concrete, **86.821**
Shock vibrations, effect on fresh concrete, **85.214**
Shoring
adequate specifications for, **80.199**
column mounted, **83.455, 84.949**
when to use, **86.5**
composite construction, **84.815**
double-deck single-post, **86.713**
failure causes, **77.607, 79.572**
horizontal, aluminum, **82.185**
horizontal for box culvert, **86.867**
preshoring technique speeds cycle, **86.307**
safety checklist, **81.111**
safety regulations, **86.713**
safety slide set, **82.369**
supported on false floor, for hospital extension, **81.690**
supports bridge for repair, **84.744**
T-heads unsafe, **86.904**
Shotblasting, equipment and procedures, **86.927**
Shotcrete
air content loss, **84.633**
arch built over expanded metal, **85.197**
dam spillway construction, **84.633**
dome construction with insulating foam, **78.405**
dome modules for residences, **85.598**
dry and wet mix processes compared, **84.629**
dry mix shooting techniques, **84.641**
encasement of reinforcement, **84.641**
equipment for wet or dry, **80.189**
home construction on inflated forms, **85.583**
insulated panel backing, **78.279**
over polystyrene core for home walls, **85.592**
simulates rocks for zoo, **82.656**
steel-fiber-reinforced, uses and equipment, **80.189**
swimming pool construction, **77.323**
wire/urethane panel backing, **80.148**
Shotcrete repair
method for buildings, **81.379**
related work with, **77.159**
where used, **81.31**
Shotcreting
crew duties and organization, **78.27**
safety precautions, **78.27**
water tank construction, **78.471**
Shotcreting personnel, training programs for, **82.851**
Shoulders (highway), concrete, extend pavement life, **78.509**
Shrinkage
drying
field test proposed, **84.663**
polypropylene fiber effect, **86.363**
Shrinkage compensating concrete
admixture for making, **83.331**
how it aids post-tensioning, **83.331, 85.147**
industrial floors, **79.110**
post-tensioned slab on grade, **79.117**
water tanks, **78.126**
Shuffleboard court, leveling to specifications, **77.141**
Side form spacers, **84.448**
purpose and types available, **81.825**
specifying, **80.199**
Sidewalks. *See also* Bikeways
exposed aggregate surface, construction methods, **78.335**
frozen at early age, **86.890**
historic, built 1895, **82.218**
joint requirements, **86.160**
repair, slotted drain, **80.101**
slabjacking repair, **80.368**
slip resistance, **77.755**
Silane weatherproofing, repels moisture, **84.967**
Silica fume. *See also* Microsilica
description, sources, **82.443**
problems in using, **82.443**
terminology controversy, **86.338**
terminology defended, **85.883**
ways to use in concrete, **82.443**
Silicone joint sealant, stops bleeding asphalt, **84.748**
Silicones, vaporproofing walls, **81.31**
Silos
cement storage, slipformed/post-tensioned, **82.45**
horizontal farm, built by tilt-up, **81.471**
renovated to condominiums, **83.5**
renovated to luxury hotel, **81.385**
slipforming ring beam for, **82.64**
Silt casting, Arcosanti method adds color/texture, **81.323**
Sisal fibers, reinforcement properties, **81.261**
Sistema Cortina
improvements made, **81.717**
lift slab-plus-walls, **77.90**
Site preparation, before concrete delivery, **85.841**
Site selection, earth-sheltered construction, **80.653**
Skateboard parks, **77.500**
Skateboard track, constructed in concrete, **77.328**
Skid resistance
pavements, improved by grooving, **83.619**
percussive grooving for, **82.309, 82.611**
provided by flame treatment, **78.275**
Skin injury, cement burns, **79.704, 82.361**
Skip joist forming, competes with steel frame, **81.883**
Slab forms
box culvert construction, **86.867**
construction cycle aided by preshoring, **86.307**
fly with folded panels, **84.385**
how to choose best system, **86.5**
Slab glass. *See* Faceted glass
Slab on grade. *See also* Flatwork; Floors
basic construction practice, **78.21**
checkerboard vs. strip placement, **81.745**
construction for factory service, **85.446**
crack control with polypropylene fibers, **86.371**
crack reduction methods, **81.739**
cracking affected by base, **81.739**
curling
causes and prevention, **86.571**
has it stopped?, **77.506**
embedded heating systems, **86.561**
finishing and placing demo (Kansas), **83.486**
insulation needed over permafrost, **82.780**
jointing for irregular shapes, **86.391**
jointing practices, **86.561**
moisture migration through, **85.136**
moisture resistant construction, **86.472**
polypropylene-fiber reinforcement, **85.446**
positioning reinforcement, **77.765**
post-tensioned design, **83.313**
post-tensioned for flatness, **83.396**
railroad track support, **84.309**
rain damage repaired, **86.570**
reinforced for tennis court, **77.317**
residential
reinforcement needs, **86.29**
types outlined, **86.29**
settlement corrected by slabjacking, **81.147**
shrinkage compensating concrete, **79.110**
strength vs. thickness, **84.902**
Slab topping
cracking problems, **86.162**
polypropylene fibers in, **86.371**
Slabjacking
equipment and applications, **78.428**
repair procedures with, **77.161**
techniques and applications, **81.147**
Slabs. *See also* Floors; Lift slab
composite, forming methods, **85.437**
flat plate, built with precast panel forms, **82.355**
loads during construction, **86.307**
preshoring speeds construction cycle, **86.307**
repair with overlays, **77.143**
simply supported, curling, **86.894, 86.903**
Slag
admixture, effect on concrete properties, **82.448**
cause of greenish blue stains, **86.736**
ground, how to use in concrete, **82.448**
Slag cement, saves production energy, **81.347**
Slip resistance, grooving for hoof traffic, **81.770**
Slipforming
blockout details, **78.262**
construction practices, **78.492**
form design and construction, **78.262**
high-rise building, **77.597**
combined with site precasting, **80.331**
office tower construction, **78.533**
post-tensioned silo, **82.45**
questions/answers, **79.545**
rate of slide, **78.262**

ring beam for silo, **82.64**
state-of-the-art report, **78.262**
tolerances, **78.262**
tower (Reunion) in Dallas, **77.620**
vertical applications, **78.262**

Slipforming (horizontal)
cast-in-place pipe, **79.163**
curb and gutter, **79.402, 86.699**
dam faces, **82.713**
pavement, equipment and methods, **86.439**

Slump
affected by superplasticizers, **78.142**
factors influencing, **86.139**
field adjustment, **85.855**
method of measuring, **81.836**
polypropylene fiber influence on, **86.363**

Slump control, superplasticizer effects, **85.337**

Slump loss, reasons/remedies, **82.429**

Slump test
brief description, **85.833**
proper method important, **86.724**
purpose and methods, **81.557**

Slurry walls
bentonite with cement, construction methods, **85.939**
construction methods, **77.17, 81.907**

Smoke stain, removal from concrete, **86.736**

Snow melting system, installed in slab, **79.705**

Soil cement
central plant mixing, **84.725**
compaction and curing, **84.725**
layer retains hazardous waste, **84.662**
mixed-in-place method, **84.725**
properties, **84.31**
uses described, **84.31**

Soil compaction
measurement, **85.681**
methods and equipment, **85.681**

Soil conditions
evaluating need for compaction, **85.681**
vital to earth-sheltered construction, **80.653**

Soil expansion. *See* Expansive soils

Soil properties, reviewed for earth-sheltered building, **82.485**

Soil stabilization, lime on muddy site, **85.366**

Solar energy
concrete collectors, **83.554**
directory of design engineers, **78.475**
passive systems use concrete, **83.532**
stored in concrete building mass, **78.393**

Solar heating
earth-sheltered home, **82.364**
system for industrial building, **78.391**
system in insulated shotcreted building, **78.279**

Soldier Field, renovation with latex modified concrete, **82.641**

Soleri, Paolo, Arcosanti progress reported, **81.323**

Sonic testing, pulse-echo method, methods and applications, **86.129**

Sound absorption, lightweight concrete floors, **82.754**

Sound barriers. *See* Noise control

Sound transmission, wall types compared, **79.375**

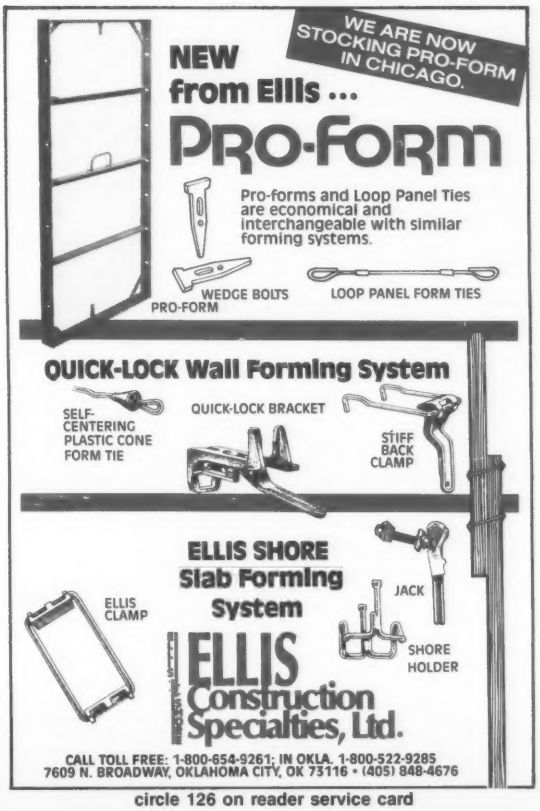
Space station, built of concrete in outer space, **85.94**

Spalling, causes in bridge decks, **78.323**

Sparkling aggregates, use on sidewalks, **85.463**

Specifications
architectural concrete, **79.6**
defects and how to deal with them, **85.458**
epoxy coated rebars, **84.809**
epoxy repair materials, **84.873**
floor flatness requirements, **82.865**
floor flatness tolerances, **81.673**
how to cover formwork, **80.199**
industrial/commercial floor, **81.125**
international list of standards, **86.681**
limits on use of performance type, **79.757**
performance type preferred for ready mix, **79.471**
pre-pour conference clarifies intent, **85.265**

(more)


WE ARE NOW STOCKING PRO-FORM IN CHICAGO.
NEW from Ellis ...
PRO-FORM
Pro-forms and Loop Panel Ties are economical and interchangeable with similar forming systems.
WEDGE BOLTS PRO-FORM
LOOP PANEL FORM TIES
QUICK-LOCK Wall Forming System
SELF-CENTERING PLASTIC CONE FORM TIE
QUICK-LOCK BRACKET
STIFF BACK CLAMP
ELLIS SHORE Slab Forming System
ELLIS CLAMP
JACK
SHORE HOLDER
ELLIS Construction Specialties, Ltd.
CALL TOLL FREE: 1-800-654-9261; IN OKLA. 1-800-522-9285
7609 N. BROADWAY, OKLAHOMA CITY, OK 73116 • (405) 848-4676

circle 126 on reader service card

THE DEEP DIGGER

E-16-75-HDC

Designed especially for partial depth patching or where deeper cutting of concrete is necessary, it will reduce or eliminate the need for labor intensive jack hammering and saw cutting.

- Electric 440 volt, 3 phase
- 16" Cutting path
- 75 H.P. Electric motor
- Hydraulic bottom dump dust collector
- Cost effective compared to traditional methods
- Maneuverable
- Virtually dust-free
- Cutting depth: ¼ inch to 4 inches depending on the P.S.I. of concrete, type and size of aggregate, and reinforcing steel
- Useful for other light cleaning needs
- Nationwide sub-contracting available

NELCO MANUFACTURING CORP.
6215 Aluma Valley Drive, Oklahoma City, OK 73121
TELEX: 796056 405/478-3440

circle 160 on reader service card

Specifications . . . continued
problems of interpretation, **85.378**
provision for extras, **78.337**
ready mixed concrete, **85.841**
reference standard ACI 301
described, **83.451**
recommended, **83.449**
reference standards for, **83.930, 84.1126**
reinforcing bars, **81.819**
tolerance magnitudes discussed, **86.491**
tolerance provisions, **79.659**
waterproofing checklist, **87.321**

Spillway, shotcrete construction, **84.633**

Spiral staircase, construction, **85.191**

Splices
grouted sleeve for rebar, **85.929**
lap at construction joint, connection boxes or strips, **86.552**
mechanical for piles, **82.96**
mechanical for rebar, **83.389, 85.23**
mechanical for rebar at bulkhead, **84.452**
welded for reinforcement, **81.807**

Splitter, removes hard concrete from mixer drums, **82.208**

Sprinklers, automatic, value in fire protection, **86.633**

Stables, concrete buildings resist fire, **86.633**

Stacks. *See* Chimneys

Stain removal
chemical methods, **86.539**
chemicals used for, **86.961**
greenish blue discoloration, **86.736**
history of previous studies, **86.539**
joint sealant from white concrete, **86.330**
mechanical methods, **86.539**
oil, **84.844**
oil and clay, **77.128**
pink discoloration, **77.128**
poultice technique, **86.539**
poultices for, **86.561**
procedures for specific stains, **86.736, 86.821**
rust, **77.128**
safe practices for chemical use, **86.961**
safety precautions, **86.905**

Stained glass. *See* Faceted glass

Stainless steel, reinforcement, properties and specifications, **86.46**

Stains. *See also* Discoloration
architectural concrete, questions/answers, **78.608**
chemical, color concrete, **82.19**
greenish blue discoloration, **77.128**

Stairs. *See also* Steps
precast, design and installation, **84.970**
spiral, formwork for, **85.191**

Stamped concrete. *See* Pattern stamped

Standard Building Code, changes related to concrete, **84.23**

Steel basements, compete with concrete, **78.215**

Steel fibers. *See* Fiber reinforcement

Steps, residential, reinforcement for, **86.29**

Stirrups, bent from wire mesh, **84.591**

Stitch drilling, cuts Panama Canal lock floors, **85.751**

Stitching, crack repair method, **81.31, 85.37**

Stonehenge, replica in concrete is war memorial, **85.443**

Straightedges, types for finishing concrete, **86.786**

Strength. *See* Compressive strength; Flexural strength

Structural design
aids for short span bridges, **85.649**
charts for horizontal forms, **84.648**
charts for vertical forms, **84.392**
columns, computer compares shapes, **86.478**
composite steel-concrete, **84.815**
cost of steel vs. concrete, **77.213**
design-build system benefits, **85.911**
design-build team fast tracks concrete, **85.251**
earth-sheltered construction, **82.493**
earthquake forces, code requirements, **84.516**
earthquake resistance, **84.489, 86.379**
errors lead to failures, **81.641**
footings for earth-sheltered building, **82.499**
frame shortening in high-rise concrete, **83.31**
gravity retaining walls, **84.977**
high-rise construction, Metropolitan Tower, **86.859**
industrial slabs on grade, **85.13**
international list of standards, **86.681**
parking deck, expansion joint considerations, **81.651**
pavements for parking areas, **82.269**
reinforcement details, **81.815**
square abutments for skewed bridges, **78.465**
tolerances suited to owner need, **86.491**

Structural movement, monitoring device, **80.187**

Subcontract form, issued by AIA, **78.798**

Subways, Washington, DC Metro, **77.263**

Sugar, effect on hardened concrete, **81.25**

Sulfate resistance
fly ash concrete, **84.346**
type V cement with pozzolan, **84.243**

Sulfur mortars, performance history, **77.226**

Summer concreting. *See* Hot weather

Superflat floors. *See* Floor finishing; Floor flatness

Superplasticizers, 79.383
action explained, **82.409**
added at batch plant for flowing mix, **85.337**
affect concrete properties, **78.142**
affect freeze-thaw behavior, **77.642**
effect on properties of concrete, **82.409**
European use in flowing concrete, **79.25**
how to use, **82.409**
placement methods with, **85.763**
trouble in low-sand mixes, **86.160**
types F and G compared, **85.337**
use at Trump Tower, **82.723**
use for summer slump control, **82.429**
use in basement walls, **79.633**
use in bottom-up pumping, **86.533**
use on Baltimore metro, **81.907**
use with other admixtures, **85.337**

Surface finish
architectural concrete
custom form liners, **82.567**
examples from Europe, **82.575**
grout cleandown, **79.319**
preventing defects, **79.323**
questions/answers, **78.585**
board marks like barn wood, **80.470**
coatings hide defects, **77.481**
defect causes pictured, **79.719**
flatwork defects, remedies, **79.247**
formwork needs for tooling, **84.397**
glossy concrete, **79.533**
precast panels, disperse radio wave signals, **84.741**
removing defects, **80.215**
textured with elastomeric form liners, **79.569**
types available, **80.19**
wood look on house walls, **85.601**

Surface weathering. *See* Weathering

Surge barrier, construction in Netherlands, **83.661, 86.898**

Surveying, laser instruments for, **78.516**

Swimming pools
construction methods, **77.323**
design considerations, **77.323**
repair of leaks, **77.133, 77.165**

Systems building. *See* Building systems

T

Taft bridge, 1907
construction history, **82.304**
history, **81.1034**

Taft, Lorado
Black Hawk concrete statue, **84.299**
Fountain of Time sculpture, **84.797**

Tampers
finishing flatwork with, **86.786**
soil compaction with, **85.681**

Tanks. *See also* Water tanks
steel diaphragm, shotcreted, **78.471**
storage of ultra-cold LNG, **83.465**

Tax problems, resolution by IRS, **86.493**

Technicians, concrete, certification by ACI, **86.727**

Telltale, monitors crack/joint change, **80.187**

Temperature effects. *See also* High temperature; Cold weather
fresh concrete mix, **77.267**
heat on hardened concrete, **83.853**
subarctic, on hardened concrete, **83.465**

Tennis courts
building reinforced slab, **77.317**
construction data sources, **77.52**
construction practices, **86.469, 86.748**
continuously reinforced, **79.430**
design and layout, **77.317**

Terrazzo, stain removal from, **86.821**

Test cylinders. *See also* Low strength cylinders
abuses during hot weather, **86.15**
field cured, reliability, **85.55**
field vs. standard cure, **81.669**

handle for carrying, **83.427**
how to make and cure, **81.669**
precautions in hot weather, **84.508**
purpose and use explained, **85.833**
small for high strength concrete?, **83.500**
standard curing procedures, **86.15**

Test methods
cement and water content fresh concrete, **77.427, 84.317**
control of fresh concrete, **81.557**
corrosion detection, **85.364**
cracking potential of slab on grade, new proposal, **85.775**
drying shrinkage, field, **84.663**
field performed control tests, **85.833**
grout for post-tensioning tendons, **84.47**
in-place, summary list, **84.1097**
inverted slump cone, fiber reinforced concrete, **85.5**
laboratory simulates seismic loads, **86.900**
moisture content of aggregate, **86.329, 86.902**
moisture measurement in floor slabs, **86.472**
permeability, simplified, **84.167**
pulse-echo determines internal flaws, **86.129**
shotcrete, **84.633**
standardized procedures important, **86.724**
unit weight for quality control, **86.607, 86.748**
water analysis, **85.364**
yield determination, **86.313**

Testing
accelerated strength, **81.665**
accreditation of producer's lab, **81.601**
acoustic method, finds voids in fresh concrete, **83.839**
cement, by manufacturer, **77.87**
cold weather precautions, **84.789**
compressive strength, accelerated, 5 hours, **79.607**
contractor-made cylinders, **81.669**
fire-damaged concrete, **81.609**
fire resistance measured, **79.597**
full scale double tee, **79.388**
grout properties, **83.337**
hardened concrete, petrographic methods, **81.585**
hot weather precautions, **83.381**
how to choose a laboratory, **81.591**
in-place methods compared, **81.571**
low cylinder breaks, how to handle, **81.563**
pullout method, equipment for, **81.577**
rapid analysis machine (RAM), fresh concrete, **79.121**
small cylinders, results evaluated, **79.751**
videotapes show field and lab methods, **86.407**

Testing laboratories
accreditation by AALA, **86.972**
accreditation by NVLAP, **86.731**

Testing services, specialized evaluation, classified list, **84.1102, 86.67**

Texas Commerce Tower
pumping practices, **82.59**
self raising forms for, **82.173**

Textile block
Wright design matched in precast panels, **79.309**
Wright's pattern copied on tiles, **81.495**

Theft prevention
construction site security, **84.176**
equipment checklist, **82.339**

Thermal calculations, U values, **78.407**

Thermal inertia. *See* Thermal lag

Thermal lag of concrete
affects indoor temperature, **78.393**
benefit in concrete homes, **77.272**
cuts heating-cooling costs, **80.45**
effect on heating-cooling needs, **78.399**
helps wall panels save energy, **80.458**

Thermal mass, how it works in concrete, **83.525**

Tie holes, patching methods, **80.215**

Tie wires and tying, reinforcing steel, **84.499**

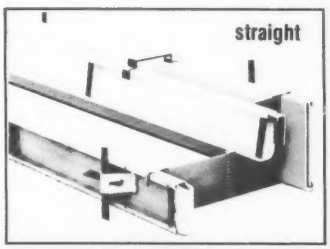
Ties. *See* Railroad ties; Form ties

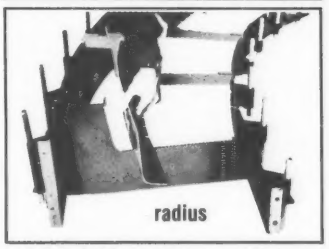
Ties and stirrups, made of welded wire fabric, **83.669**

Tile. *See also* Roof tile
bonding to concrete, **77.127**
marble on ferrocement, **77.624**

(more)

dee *forms for curbs and gutters.*





Fabricated to meet any specification

dee Concrete Accessories Co.
P.O. Box 10086, Chicago, Illinois 60610
Phone: 312-664-3664
Available at distributors of contractors supplies

circle 123 on reader service card

CONCRETE SOLUTIONS

When it comes to concrete construction, even the best facilities sooner or later require improvements, maintenance and repairs. It's only a matter of time. So, when you're looking for concrete solutions, it makes sense to look for a supplier who knows that time is what matters most. How soon can you get the products you need? Can they be applied fast and easy? What application skills are required? How quickly do they harden? How long will the job last once it's done?

The Euclid Chemical Company expertly manufactures, conveniently packages and widely distributes the latex, cementitious and epoxy-based materials you need to maintain and protect your concrete surfaces. We've been providing contractors, engineers, architects and maintenance personnel with concrete solutions for over 75 years. That's a long time. So, whether it's repairing a foundation, patching a wall, resurfacing a floor, or grouting equipment, The Euclid Chemical Company has the products and expertise to get the job done!

FREE! Euclid's Guide To Quality Products
In Ohio Call: 1-216 531-9222
Outside Ohio Call Toll Free: 1-800-321-7628

The Euclid Chemical Company
19218 Redwood Road • Cleveland, OH 44110

RPM An RPM Company

circle 130 on reader service card

Tilt-up
architectural panel finish, **77.37**
bond breaker, choosing and using, **77.547**
erection and jointing, insulated panels, **80.458**
forms for panels, **82.29**
history, **81.1035**
horizontal farm silos, **81.471**
industrial buildings with solar heat, **79.391**
industrial facilities, examples, **81.53**
insulated house walls, **85.621**
insulated wall panels save energy, **80.458**
insulation of wall panels, **85.511**
ministorage building construction, **85.511**
multistory architectural, **86.97**
multistory panel erection, **86.97**
panel detailing, **82.29**
paving methods applied, **77.37**
post-tensioned multistory, **80.527**
printing plant extension, **80.478**
questions/answers, from WOC seminars, **82.29**
rigging and erection, **82.29**
rock faced panels, **78.145**
sand cast design on panels, **78.96**
sandwich panels for home, vacuum dewatered, **82.201**
simulates stone masonry, **84.477**
wall insulation methods, **78.407**
wind loads, **83.55**

Tire marks, removal from concrete, **86.821**

Tobacco stains, removal, **86.821**

Toboggans (concrete), building and racing, **77.331**

Tolerances
ACI proposes standard, **80.743**
bridges, **80.743**
buildings, cast-in-place, **79.659, 80.743**
canal linings, **80.743**
concrete mix and ingredients, **80.743**
flatness of floors and other slabs, **79.659**
floor flatness, **81.125, 81.673, 82.865, 85.66**
measuring equipment, **86.815**
formwork considerations, **80.199**
magnitude suited to owner need, **86.491**
mass concrete, **80.743**
measuring for compliance, **79.659**
pavements, **80.743**
reinforcing steel, **80.743**
reinforcing steel placement, **84.155**
related to design, **79.659**
shoring/falsework erection, **77.607**
slipformed structures, **78.262**
special for acid brick, **80.851**
specification provisions, **79.659**

Toll roads, public opinion poll, **86.322**

Tombstones, student concrete project, **83.256**

Tooled concrete. *See also* Mechanical tooling
techniques for architectural surfaces, **82.39**

Tools
jointing in wide slab, **86.819**
pattern stamping, **86.775**

Tower construction
Frankfurt communications, **78.170**
Reunion in Dallas, **77.620**
statistics, **83.125**

Training aids. *See also* Educational programs
videotape systems, **82.857**
videotapes show test procedures, **86.407**

Transporting concrete. *See also* Pumping; Conveying
methods compared, **82.697, 83.52**

Travertine finish, ornamental flatwork, **79.237**

Tremie placement
equipment and methods, **86.123**
flow patterns of concrete, **86.943**
massive pours at Dame Point Bridge, **86.752**

Trenching, OSHA safety rules, **86.556**

Troubleshooting
architectural concrete, questions/answers, **78.575**
forming and shoring, questions/answers, **79.505**

Troubleshooting index, *Concrete Construction* magazine, illustrated, **81.980**

Troweling
causes of chatter, **86.819**
flatwork
power equipment and methods, **86.795**
recommendations, **79.225**

Trowels
hand, types available, **86.786**
power, types available, **86.795**

Trump Tower, construction practices, **82.723**

Tunnel construction
full round forms, **79.427**
Washington, DC Metro, **77.263**

Tunnel forming systems
construction details and cycle, **80.599**
construction stages explained, low-rise housing, **85.201**
cuts cost on low-rise housing, **85.201**
half section for apartments, **80.535**
high-rise residences, **77.603**
multi-unit housing, **85.603**
vibrated externally, **82.734**
when to use, **86.5**

U

Ultrasonic testing. *See* Pulse velocity

Underfloor ducts, placed in floor slab, **82.639**

Underlayments, repair cracks in floor topping, **86.166**

Underpass (railroad), precast and jacked into place, **84.306**

Undersealing, pavement restoration, **83.13**

Underwater concreting, 84.914
grout-filled bags, **86.721**
repair-related work, **77.162**
tremie flow patterns studied, **86.943**
tremie method, **86.123**
record pours at Dame Point, **86.752**

Uniform Building Code, changes related to concrete, **84.23**

Unit weight tests, purpose and methods, **81.557**

Unity Temple, Frank Lloyd Wright design described, **86.807**

Upper Stillwater Dam, slipformed face, roller compacted concrete, **82.713**

Urea, contamination of cement, **81.58**

Urethane coatings
properties and uses, **81.406**
protect against graffiti, **85.362**
protect concrete walls, **77.485**

Urethane foam, repairs leaking waterstops, **84.594**

Urethane insulation. *See also* Insulation
sprayed on inflated form, **78.405**

Urethane sealer, floor slab application, **77.25**

Urine stains, removal, **86.821**

Usonian Automatic, Wright house design, **86.496**

V

Vacuum dewatering
bridge deck applications, **81.507**
construction methods demonstrated, **81.503**
effect on concrete properties, **81.503**
floor slab construction, **79.44**
residential tilt-up panels, **82.201**
used with metallic hardener, **77.73**

Vandenberg Air Force Base, placing concrete for space launch site, **81.606**

Vapor barrier
basement construction, **78.199**
floor slabs, **80.232**
influences slab cracking, **81.739**
protected during slab work, **78.244**
screed support precautions, **78.551**
slab on grade, **78.21**
when and how to use, **81.920**

Varnish, removal from concrete, **86.821**

Vermiculite concrete
insulating value, **83.543, 85.139**
properties and production, **78.411**
properties and uses, **81.253**

Vibrating screeds
homemade used for prison paving job, **85.527**
paving applications, **82.284**
slab and pavement work, **82.729**

Vibration
affects surface appearance, **79.719**
architectural concrete, **79.6**
early history, **82.306**
external, tunnel forming system, **82.734**
improvements with revibration, **77.537**
internal, use in flatwork, **86.744**
mix designed for, **81.438**
plastic lined forms, **82.51**
recommended techniques, **85.847**

Vibration (transitory)
effect on fresh concrete, **83.406, 85.214**
bridge deck repairs, **86.260**
measuring effects of, **84.680**

Vibrators
internal, how to choose, **82.701**
performance measurement, **82.701**
types available, **82.701**

Video systems, aid employee training, **82.857**

Vinyl paints, properties and uses, **81.406**

Void forms
prevent damage from expansive soils, **84.657**
shaft, self stripping, **86.947**
under grade beams in expansive soils, **78.294**

Volcanic ash, Mount St. Helens, affects cement clinker, **80.813**

W

Waferboard, forming properties and uses, **84.447, 85.237**

Wah Luck house, precast and cast in place combined, **84.131**

Walkways, elevated, concrete replaces wood, **80.343**

Wall forms. *See also* Forms; Formwork
box culvert construction, **86.867**
cost comparisons, **86.21**
curved, have straight aluminum wales, **82.816**
ganged, selecting best system, **86.21**
modular aluminum, **82.185**
permanent, small metal panels, **82.370**
permanent insulating panels, concrete in voids, **77.599**
precast concrete panels, **84.451**
pumped from bottom, **86.533**
residential construction, **85.915**
small insulated panels, permanent, **80.488**

Wall panels. *See also* Tilt-up; Precast
basement, with integral footings, **86.877**
insulated for prison construction, **86.145**
multistory tilt-up, **86.97**

Walls. *See also* Retaining walls
bearing, made higher to support masonry, **82.302**
cast around curved panel of insulation, **80.482**
construction against excavation, **85.691**
continuous placement up to 50 feet high, **79.29**
controlled pour reduces form pressure, **85.516**
insulated tilt-up panel system, **80.458**
insulation for, **83.550**
insulation methods, **78.407, 83.554**
insulation poured between concrete plank, **83.249**
joint spacing and details, **86.561**
plastered, expansion joints, **80.484**
privacy or noise abatement, precast concrete, **83.767**
pumping from bottom, **86.533**
repair and recoating, **77.148**
residential
pumped concrete for, **79.19**
reinforcement for, **86.29**
shotcrete over insulation, **78.279**
sound transmission ratings, **79.375**
types needed for farm use, **86.639**
wire and insulation core, with stucco or shotcrete, **80.467**

Washington, DC Metro
post-tensioned concrete station, **84.125**
tunnel and station building, **77.263**

Waste disposal, hazardous solidified with cement, **85.781**

Waste storage, slurry walls limit seepage, **85.939**

Water
excess in mix is costly, **80.339**
mixing, field test for quality, **85.364**

Water-cement ratio
effect on concrete properties, **85.827**
effect on strength, **82.286**

Water content, measuring in fresh concrete, **77.427**

Water reducers
effect on mixing, placing, **79.383**
use and benefits, **85.333**

Water repellency, improved with silane, **84.967**

(more)

Make tough jobs easy with Klein professional tools and equipment for heavy construction. Rugged quality. Long service life. Also hand tools and occupational protective equipment. At Klein distributors.

KLEIN
An independent, family-owned company ...since 1857.

Send for FREE Heavy Construction Catalog

Klein Tools, Inc., 7200 McCormick, Chicago, IL 60645
87226
circle 143 on reader service card

mobile concrete mixer

ELKIN hi-tech mobile concrete mixer

delivers:

- **the Exact Amount**
  (Metered up to 60 cu. yds. per hour)
- **the Exact Mix**
  (Materials proportioning controls)
- **the Exact Time**
  (Mixed as needed at the jobsite)

Better Concrete at Lower Cost for both Producer and Consumer

Plus: choice of 1, 2 or 3 pressurized fiberglass admixture tanks for additives; choice of aggregate bins; and enough water for any mix and clean-up.

For more details, call or write:

Elkin Manufacturing, Inc.
2431 Route 286, West, Indiana, PA 15701
(412) 349-6300, (800) 245-6899

circle 125 on reader service card

REPRINT COLLECTIONS

Many basic articles from *Concrete Construction* have been grouped into booklets referred to as reprint collections. The available reprint collections and their prices are listed below.

135	Architectural Concrete: Design and Construction Practices	$9.00
139	Concrete Repair: Materials and Methods	$9.00
140	Concrete Floors: Design and Construction	$9.00
143	Cracks in Concrete	$6.00
145	Earth-Sheltered Construction	$6.00
146	Failure Lessons in Concrete Construction	$6.00
149	Forming and Form Materials	$9.00
151	Guide to Finishing and Related Problems	$9.00
153	Repair of Concrete	$6.00
154	Guide to Troubleshooting Concrete Forming and Shoring Problems	$9.00
155	Guide to Troubleshooting Site-Cast Architectural Concrete	$9.00
156	Concrete Inspection	$6.00
158	Recreational Uses for Concrete	$9.00
162	Concrete in Residential Construction	$6.00
163	Surface Defects in Concrete	$9.00
164	Concrete Testing	$9.00
165	Tilt-up Construction	$6.00
166	Transporting and Handling Concrete	$6.00
167	Troubleshooting Concrete Flatwork and Paving Problems	$6.00
169	Vibrating Concrete	$6.00
170	Waterproofing and Dampproofing Concrete	$9.00
201	Basics of Concrete	$9.00
211	Removing Stains from Concrete	$9.00

All orders for reprint collections should be prepaid by check or money order and directed to:

BOOK AND REPRINT DIVISION
Concrete Construction Publications, Inc.
426 South Westgate
Addison, IL 60101

Water tanks
base slab construction, **77.298**
design and construction, **77.444**
dome roof for, **86.399**
shotcreted, prestressed, **78.471**
use shrinkage compensating concrete, **78.126**

Water Tower Place, design and construction, **83.93**

Water treatment plants, formwork for, **77.615**

Waterblasting
equipment and procedures, **86.927**
robotic machine removes bad concrete, **85.785**

Watering tank, freeze proof, **81.535**

Waterproofing. *See also* Dampproofing
application methods, **86.384**
barrier installation, **81.313**
basements, asphaltic coating, **85.450**
basements for homes, **78.211**
below-grade systems compared, **86.384**
bentonite for below-grade walls, **85.691**
checklist for specifiers and builders, **81.321**
earth-sheltered construction, **80.659**
materials for barriers, **81.313**
repair-related work, **77.163**
selecting the system, **81.313**
when is it needed?, **81.305**

Waterproofing materials
earth-sheltered construction, **80.669, 80.675**
properties compared, **86.384**

Waterproofing methods, earth-sheltered construction, **80.675**

Waterstops
basement walls, **80.474**
detail at wall-slab joint, **86.744**
deteriorated, removed by core drilling, **85.747**
repair of leaks at, **84.594**
selection and installation, **84.569**
types available, **84.569**

Wax stains, removal from concrete, **86.821**

Weather, documented in work log, **79.188**

Welded wire fabric. *See* Reinforcing steel

Welding requirements, reinforcing steel, **81.807**

Westinghouse Bridge, rehabilitation, **83.598**

Wheelbarrows, how to select and use, **84.737**

White cement
description and uses, **81.331**
use in colored concrete, **82.19**

White concrete, curing discoloration, **84.769**

White stains, causes and removal, **86.821**

Whitetopping, overlay on asphalt parking area, **85.425**

Willow Creek Dam, shotcreted spillway, **84.633**

Wind chill, effect on concrete freezing, **86.415, 86.41**

Winter concreting. *See* Cold weather

Wirand. *See* Fiber reinforcement, steel

Wiring. *See* Electrical wiring

Wood, fabricated members support formwork, **86.449**

Wood base panels, types available for forming, **85.237**

Wood basements
compete with concrete, **78.215**
Wisconsin, **82.654**
deficiencies reported, **78.234**
failure reported, **82.884**
Iowa controversy, **77.380**

Wood foundations
fail in expansive soil, **85.1033**
fail in thunderstorm, **82.884**

Wood stains, removal from concrete, **86.821**

World of Concrete
1977 record attendance, **77.200**
1977 show in New Orleans, **77.7**
1978 show in Phoenix, **78.7**
1987 demonstrations, **86.892**
1987 seminars, **86.993**
British pavilion featured, **78.17**
changes to come in 1981, **80.936**
contractor's view, **86.1083**
cosponsors for 1977, **77.14**
European exposition in 1986, **86.1148**
exhibits expand for 1985, **84.746**
expansion for 1978, **77.402**
getting best from '84 show, **84.149**
growth in 1980, **80.417**
history of growth, **82.845**
new cosponsors, **79.554**
new products in 1984, **83.974**
new seminars for 1985, **84.823**
offers overseas marketing, **81.911**
record attendance, 1979, **79.186**
seminar program progress, **83.48**
seminar questions/answers, **85.55**
seminars for 1984, **83.841**
seminars for 1986, **85.948**
tips for enjoying '85 show, **85.49**

Wright, Frank Lloyd
Biltmore Hotel expansion, **79.307, 81.495**
Fallingwater design, **83.109**
Guggenheim Museum, **83.137**
Unity Temple design, **86.807**
Usonian Automatic houses, **85.496**

Y

Yield determination, calculation methods, **85.833, 86.313**

Yield test
ASTM method, **85.833**
measurement methods explained, **85.313**

Z

Zinc, in aggregate retards set, **77.237**

Zoning problems, earth-sheltered construction, **82.589**